GUARDIANS OF THE GALAXY

SERVICE AND OPERATION MANUAL

WARNING

IMPORTANT HEALTH WARNING: PHOTOSENSITIVE SEIZURES - A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns. Even people with no history of seizures of epilepsy may have an undiagnosed condition that can cause "photosensitive epileptic seizures" due to certain visual images, flashing lights or patterns. Symptoms can include lightheadedness, altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, momentary loss of awareness, and loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

IMMEDIATELY STOP PLAYING AND CONSULT A DOCTOR IF YOU EXPERIENCE ANY OF THESE SYMPTOMS.

ATTENTION! IMPORTANT WARRANTY INFORMATION

The electronics system, node network architecture, mechanical devices and associated software control systems in this pinball machine are designed to work with genuine Stern Pinball accessories and devices.

Installation of non-authorized accessories, lamps, LED's, motors or other devices or modification of electro-mechanical devices may damage the system and will void your warranty.

Stern Pinball machines are assembled in Elk Grove Village, Illinois, USA. Stern Pinball has inspected each game element to ensure it meets our quality standards.

Each pinball machine has unique characteristics that make it a one-of-a-kind American made product. Each will have variations in appearance resulting from differences in the machine's particular wood parts, individual printed art and mechanical assemblies. No playfield is perfectly flat and varies depending on the season. Game play will result in playfield dimpling as the harder steel ball contacts the wood and coating; over time multiple dimples will blend to make them less noticeable. Normal plastic insert crazing (tiny stress cracks) and ghosting (small cloudy areas around insert edges) are often seen in pinball machines, due to a combination of plastic mold stress, pushing of inserts into purposely undersized holes, and heating and breaking of inserts' plastic "skin" when the playfield field is sanded.

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Games configured for North America operate on 60 cycle electricity only. These games will not operate in countries with 50 cycle electricity (Europe, UK, Australia).

MANUAL #780-50L6-00
GUARDIANS OF THE GALAXY LE #500-55L6-01
GUARDIANS OF THE GALAXY PREMIUM #500-55L7-01

1-800-KICKERS - parts.service@sternpinball.com
www.sternpinball.com - facebook.com/sternpinball

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1. SETUP AND MOVING

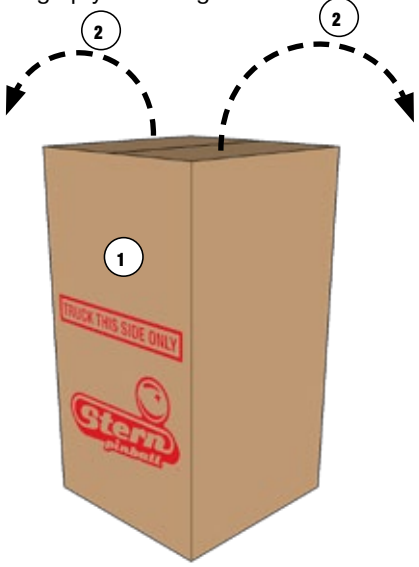
1.1 FIRST-TIME SETUP INSTRUCTIONS

Your brand new Stern Pinball Machine is carefully packed for safety and security. For your safety, exercise caution and use the correct tools and sufficient help when setting up your new game.

TOOLS REQUIRED

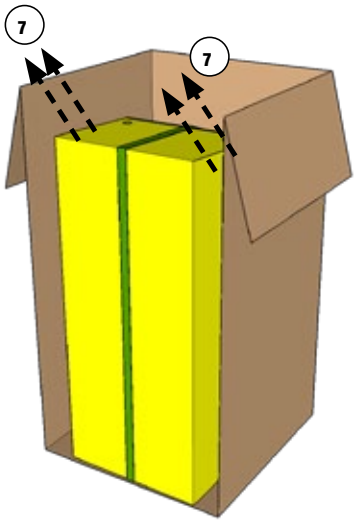
- 5/8" Socket Wrench
- Utility Knife
- Snips
- An Assistant

CAUTION: AT LEAST TWO (2) PEOPLE ARE REQUIRED TO MOVE AND MANEUVER THE GAME. USE PROPER MOVING EQUIPMENT AND EXTREME CARE WHILE HANDLING. STERN PINBALL MACHINES WEIGH OVER 250LBS BOXED.

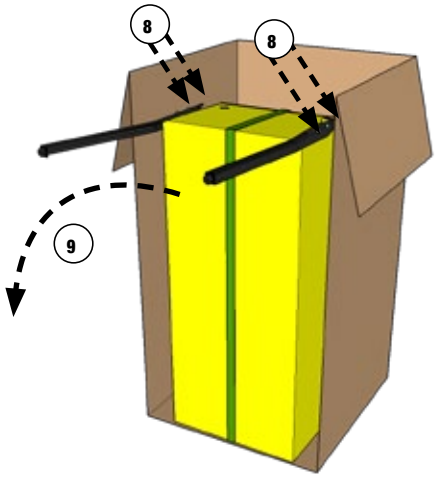


1. Locate the side labeled "TRUCK THIS SIDE ONLY". The bottom of the game faces this side.
2. Open the top box flaps by pulling hard in an upward motion on each flap. If the flaps are taped, cut the tape first, taking care to avoid the box staples.

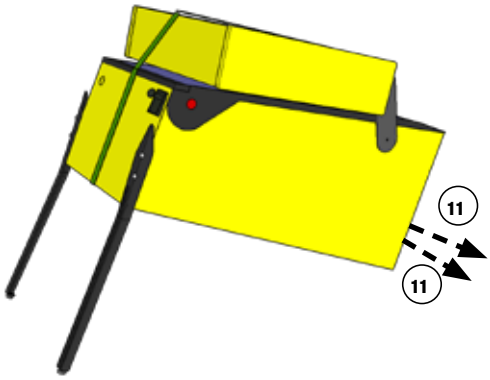
3. Remove the four (4) foam pieces and two (2) narrow box tubes which contain the four (4) identical legs with levelers.
4. DO NOT CUT STRAPPING YET. Keep backbox secured in the down position.
5. With the utility knife, carefully cut down the left and right corners of the box.



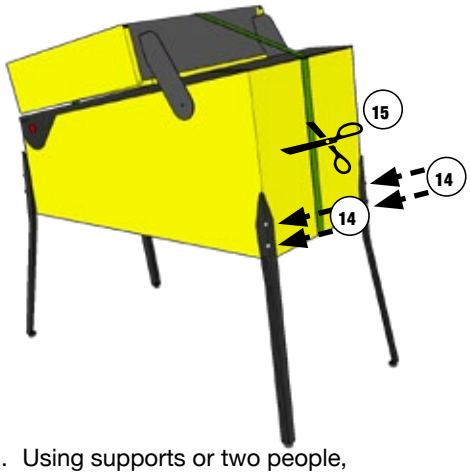
6. Let the face fall forward and remove the entire side by carefully cutting the bottom.
7. With the game still in its folded position, use a ⅝" wrench to loosen and remove the 2 leg bolts on each side of the front cabinet. Ensure the leg levelers are screwed all the way into the legs.



8. Install front legs using the bolts removed from the cabinet. Secure tightly.
9. Have someone help you carefully set the game down on the front legs.

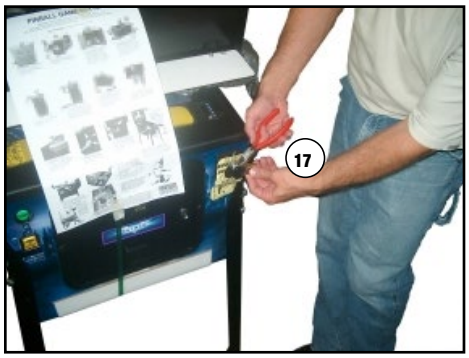


10. Set aside the open box.
11. With a ⅝" socket wrench, loosen and remove the 2 leg bolts on each side of the rear cabinet, 4 total.

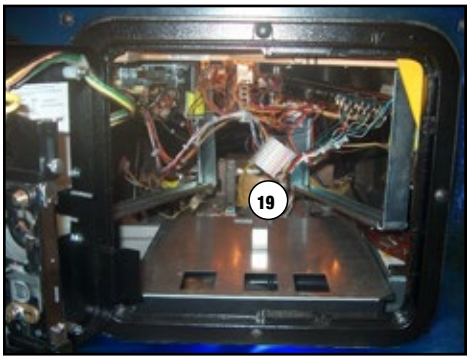


12. Using supports or two people, prop the rear of the cabinet up.
13. Ensure the rear leg levelers are screwed all the way into the legs.
14. Install rear legs using the 4 bolts removed from step 11.

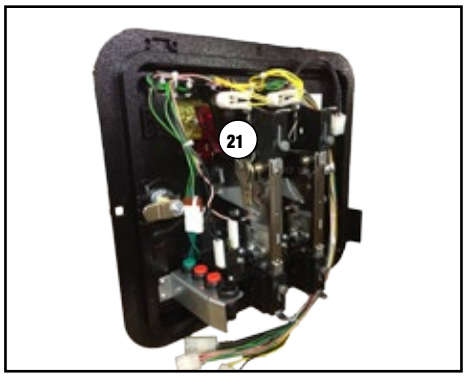
FIRST-TIME SETUP CONTINUED



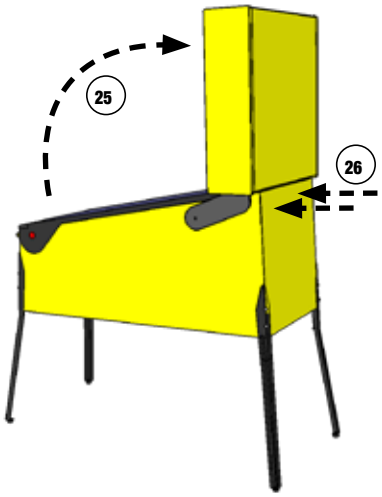
15. Cut nylon strapping and remove protective strap corner guards.
16. Locate the factory keys, either on the shooter rod or taped to the playfield glass.
17. Using snips, cut the tie-wrap securing the keys if required. One set of keys is for the front coin door, the other set of keys is for accessing components in the backbox.



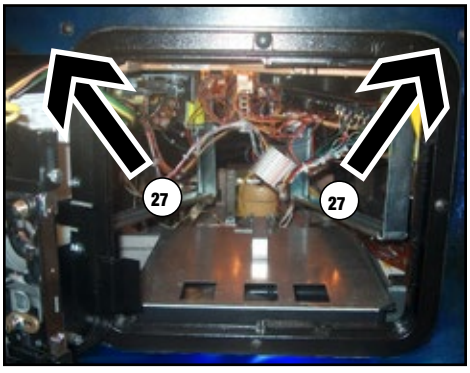
18. Open the front coin door.
19. Reach into the game and remove the retaining clip at the rear of the cash box.
20. Remove the cash box lid by sliding it toward you.



21. Store the backbox keys, if desired, on the metal hook located in the coin door.
22. Locate and remove the pinballs, plumb bob, and backbox bolts from the cash box.
23. Replace the cash box lid and retaining clip for future use.



24. Locate the two (2) backbox bolts in the cash box.
25. Carefully raise backbox to upright position while ensuring that cables are not pinched.
26. Use the ⅝" wrench to Install the two (2) backbox bolts to secure the backbox as indicated on the back of the cabinet.



27. Reach inside the cabinet and lift the two latches located on either side of the coin door.
28. Remove the front top molding.

29. Remove the playfield glass by sliding it toward you and carefully place it in a safe location. Remove all playfield shipping tie downs, shipping blocks, and packing foam, and follow any game-specific unpacking instructions included in the playfield, if present.

CAUTION: PLAYFIELD GLASS IS MADE FROM HIGH-STRENGTH TEMPERED GLASS. TEMPERED GLASS IS SENSITIVE TO EXTREME TEMPERATURE SHIFTS AND CORNER NICKS, WHICH CAN CAUSE THE GLASS TO FAIL CATASTROPHICALLY. TAKE CARE TO STORE THE GLASS ON A SOFT, ROOM-TEMPERATURE SURFACE AND PREVENT THE CORNERS FROM BEING DAMAGED.

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FIRST-TIME SETUP CONTINUED

30. If pinballs were already installed into the lower ball trough, remove them before lifting the playfield.
31. Grasp the lower arch between the flippers, and firmly but gently pull directly up to raise the playfield 8 to 12 inches.
32. While holding the playfield up, pull the playfield toward you until the two playfield supports are over the front edge of the cabinet.
33. Rest the playfield on the front edge of the cabinet.
34. Raise the playfield and rest it against the backbox.
35. Visually inspect all cabinet cables and connector terminations; ensure no wires or cables are pinched and that cable harnesses are not pulled tight.
36. Locate the plumb bob in the parts bag in the cash box.
37. Slide plumb bob onto the hanger wire. Note: the vertical position of the plumb bob affects tilt sensitivity - higher makes the game more sensitive to tilting.
38. Tighten the thumb screw finger-tight.
39. Install the correct number of pinballs. Refer to the decal on the lock down assembly for the correct number of pinballs.

LOCATING, LEVELING, AND FINAL SETUP

1. Select a location that is indoors, out of direct sunlight, and climate controlled. Excessive moisture/humidity can cause long-term damage to your game.
2. Adjust the front or rear levelers as necessary to position the playfield level bubble, located on the front right of the playfield next to the shooter lane, to float between the two (2) black lines. This will place the playfield at the recommended 6.5° pitch. Playfield angles greater than 6.5° can be achieved by turning out the rear leg leveler(s) for increased difficulty and faster gameplay.
3. Use a pinball to roll down the center of the playfield for side-to-side leveling, or use an external bubble level, digital level, or smartphone level app.
4. Plug into a grounded outlet and check for proper operation through DIAGNOSTICS.
5. Check the coin door: With the door closed, insert coins to verify proper operation.
6. Play game: Check for satisfactory operation and adjust game volume (push the Red Buttons inside the Coin Door).
7. If desired, perform any game diagnostics, game adjustments, and pricing settings at this time.

SPIKE PINBALL SOFTWARE UPDATE INSTRUCTIONS

1. Obtain game software update file (filename ends in ".spk") from www.sternpinball.com or from authorized Stern distributor.
2. Place game software update file (".spk") in root directory of a blank FAT32-formatted USB flash drive
3. Use backbox power switch to turn off game
4. Plug in USB flash drive to CPU board USB connector (CN20 or CN21). Refer to www.sternpinball.com
5. Turn on game
6. The game will automatically begin software update
7. Select the correct .spk update file from list.
8. Press Enter on the service switches to start update
9. When the display indicates "Update Complete", turn off game
10. Remove USB flash drive from CPU board
11. Turn game on to complete the update and play pinball!
12. Detailed instructions and troubleshooting tips are available in the game manual, www.sternpinball.com and authorized Stern distributors.

1.2 ADJUSTMENTS MENU

STANDARD ADJUSTMENTS

Perform the below steps to review the adjustments.

Enter the Service Menu, then enter the Standard Adjustments Menu.

Press SELECT. Press BACK to exit or escape at any time.

Press [>]. Go to the ADJ icon. Press SELECT.

Go to the S.P.I. icon. Press SELECT.

STANDARD ADJUSTMENT #1 appears with the adjustment name flashing. While the adjustment name is flashing press [<] [>] to move between adjustments.

To change the adjustment setting press SELECT. While the adjustment setting is flashing, press [<] [>] repeatedly until the desired setting appears. Press the SELECT button to “install” the change. The adjustment comment (bottom line) will indicate if the factory default setting is selected or will display INSTALLED if the change is not a factory default setting.

ID	Adjustment Name	Default Setting
1	REPLAY TYPE	AUTO
2	REPLAY PERCENTAGE	10%
3	REPLAY AWARD	CREDIT
4	REPLAY LEVELS	1
5	AUTO REPLAY START	20,000,000
6	DYNAMIC REPLAY START	60,000,000
7	REPLAY LEVEL #1	15,000,000
8	REPLAY LEVEL #2	30,000,000
9	REPLAY LEVEL #3	45,000,000
10	REPLAY LEVEL #4	60,000,000
11	REPLAY BOOST	YES
12	SPECIAL LIMIT	1
13	SPECIAL PERCENTAGE	10%
14	SPECIAL AWARD	CREDIT
15	FREE GAME LIMIT	5
16	EXTRA BALL LIMIT	5
17	EXTRA BALL PERCENTAGE	25%
18	GAME PRICING	USA 11
19	MATCH PERCENTAGE	9%
20	MATCH AWARD	CREDIT
21	BALLS PER GAME	3
22	TILT WARNINGS	2
23	CREDIT LIMIT	30
24	ALLOW HIGH SCORES	YES
25	HIGH SCORE AWARD	CREDIT
26	GRAND CHAMPION AWARDS	1
27	HIGH SCORE #1 AWARDS	1
28	HIGH SCORE #2 AWARDS	0
29	HIGH SCORE #3 AWARDS	0
30	HIGH SCORE #4 AWARDS	0
31	GRAND CHAMPION SCORE	75,000,000
32	HIGH SCORE #1	55,000,000
33	HIGH SCORE #2	40,000,000
34	HIGH SCORE #3	30,000,000
35	HIGH SCORE #4	25,000,000
36	HSTD INITIALS	3 INITIALS
37	HSTD RESET COUNT	2000
38	FREE PLAY	NO
39	LANGUAGE	ENGLISH
40	PLAYER LANGUAGE SELECT	YES
41	CUSTOM MESSAGE	ON
42	FLASH LAMP POWER	NORMAL
43	COIL PUSLE POWER	NORMAL
44	KNOCKER VOLUME	NORMAL
45	GAME RESTART	YES
46	BILL VALIDATOR	NO
47	MUSIC VOLUME	1
48	BALL SAVE TIME	0:05
49	TIMED PLUNGER	OFF
50	FLIPPER BALL LAUNCH	OFF
51	COINDOOR BALL SAVER	NO
52	COMPETITION MODE	NO
53	CONSOLATION BALL	YES
54	FAST BOOT	YES
55	Q24 OPTION	COIN METER
56	TICKET DISPENSER	NO
57	PLAYER COMPETITION	YES
58	TEAM SCORES	NO
59	LOCATION ID	0
60	GAME ID	0
61	TIME FORMAT	12-HOUR
62	COIN INPUT DELAY	30
63	LOST BALL RECOVERY	YES
64	COIN DOOR DISABLE TILT	NO
65	BACKBOX BRIGHTNESS	100%
66	COIN DOOR OPEN B.BOX BRIGHTNESS	10%

FEATURE ADJUSTMENTS

Each table has feature adjustments specific to the characteristics of that game. To access feature adjustments enter the Service Menu and then enter the Adjustments Menu.

Press SELECT to access the Service Menu. Press BACK to exit or escape at any time.

Press [>]. Go to the ADJ icon. Press SELECT.

Go to the game icon. Press SELECT.

FEATURE ADJUSTMENT #1 appears with the adjustment name flashing. With the adjustment name flashing press [<] [>] to move between adjustments. Feature adjustments are changed similarly to standard adjustments using the SELECT button to choose options and the [<] [>] buttons to cycle through available settings.

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1.3 TRANSPORTING THE GAME

When transporting the game, such as in the back of a truck or with a hand truck, the game's backbox must be secured to prevent damage to the side rails.

CAUTION

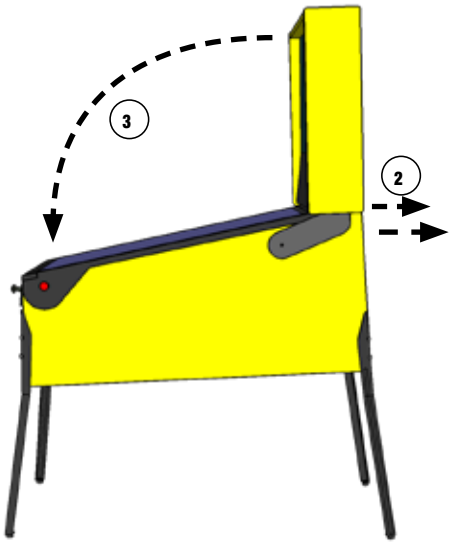
NEVER TRANSPORT THE GAME IN A MOVING VEHICLE WITH THE BACKBOX RAISED! TWO PEOPLE ARE REQUIRED TO REMOVE THE LEGS!

1. SECURE THE BACKBOX

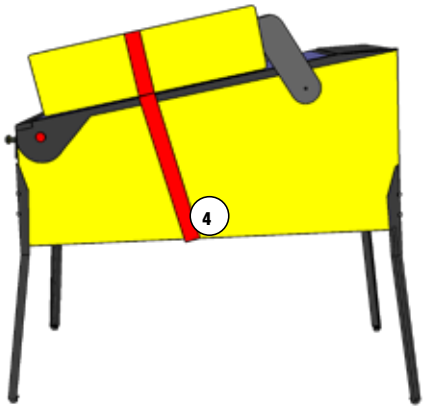
TOOLS REQUIRED

- **STRAP (500LB OR GREATER)**
- **AN ASSISTANT**
- **HAND TRUCK**

1. Ensure that the pinballs are removed from the playfield, and secure any free-moving mechanisms that may get damaged in transport

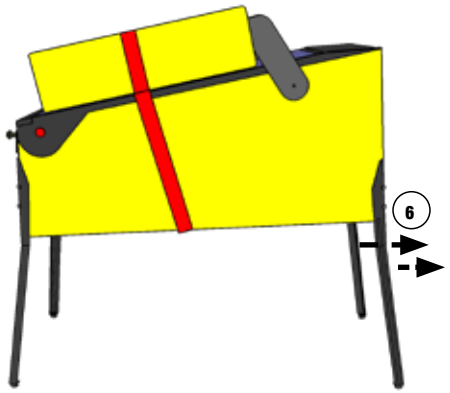


2. Remove the backbox securing bolts
3. Carefully lower the backbox onto the side rails. Use a piece of cardboard or suitable padding between the backbox and the game.

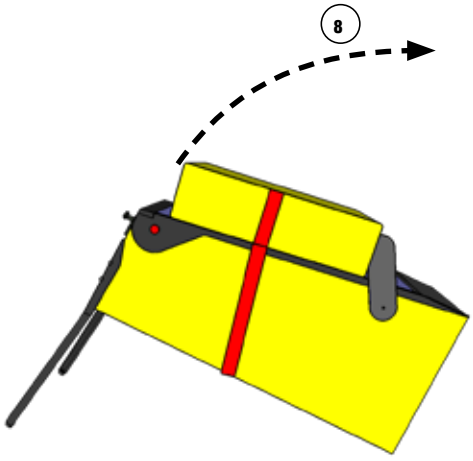


4. Securely strap the back box to the game
5. The game may be transported with the legs on. If the legs must be removed, follow the remaining steps.

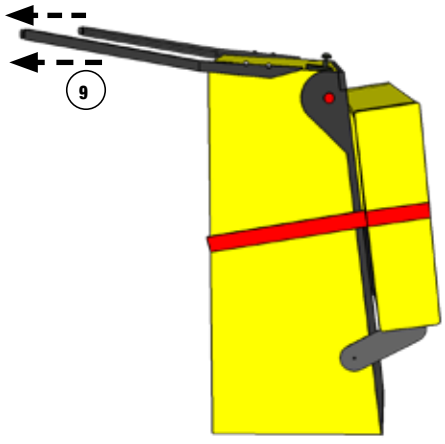
2. REMOVE THE LEGS AND STAND UP



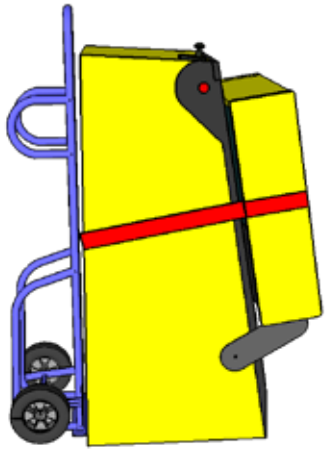
6. Remove the legs, rear legs first. Use a stool or a friend to support the rear of the game.
7. Rest the rear of the game on the ground.



8. Stand the game up on its back.



9. Remove the front two legs.



10. Secure all loose parts and transport with a hand truck in the upright position.

1.4 MAINTENANCE

REGULAR MAINTENANCE - (MONTHLY/500 GAMES)

- Remove the playfield glass
- Enter the software diagnostics menu, start lamp test, then clean and wax the playfield.
- ◊ While cleaning the playfield, identify and repair malfunctioning lights, loose parts, cracked plastics and worn rubber parts.
- While in diagnostics, enter the switch test (Select the "SW" Icon, then "TEST" Icon).
- ◊ Use a pinball to actuate all switches and verify the correct switch registers with the switch test.
- ◊ The game will play a sound to confirm the switch.
- Lift the playfield and inspect all assemblies for loose parts, broken wires or excessive wear. Look at the bottom of the cabinet for any parts that may have worked loose, then find the source.
- Check all coin door mechanisms and bill acceptor (if installed) for proper operation
- Play the game to ensure all coils and features are working
- Check the playfield to ensure it is level and set to the proper pitch using the bubble level on the right side wood rail.
- Check game audits: Replay % and Ball Time and note abnormal values which can indicate problems.
- Ensure game volume is set appropriately for the location.
- Clean both sides of the playfield glass and reinstall.
- Check and clean pinballs and replace if excessively worn or scuffed. Dirty pinballs accelerate game wear.

OVERHAUL MAINTENANCE - (5000 GAMES)

- Verify latest game software is installed
- Check flippers for excessive wear. Excessive flipper sloppiness (vertical or horizontal) or weakness indicates a flipper rebuild is required.
- Clean machine inside and out and check leg levelers for free operation.
- Visual check for loose or broken playfield and cabinet parts and repair as necessary.
- Electrical check: Plug into grounded outlet and check for proper operation through DIAGNOSTICS.
- Replace worn or dirty rubbers.
- Replace pinballs.
- Check all playfield switches with a pinball.
- Check all settings (refer to manual for factory settings).
- Check coin door: With door closed, insert coins to verify proper operation.
- Check for proper adjustment of the plumb bob tilt.
- Play game: Check for satisfactory operation.

COMMON PINBALL TOOLS

- Common nut drivers (¼", 5/16", 11/32", ⅜")
- Phillips screwdriver
- Standard Allen wrench/Hex key set
- ⅝" Socket with ratchet
- Adjustable wrench (5/8" & 9/16")
- 6" Torpedo Level (or use a pinball
- Flashlight or headlamp
- Soldering Iron (60w with flat tip), lead-free solder
- Wire cutter
- Wire stripper
- Long nose ("needle nose") pliers

1.5 MAINTENANCE KITS

Description	Part Number
Guardians of the Galaxy LE/Premium Maintenance Kit 8 oz pinball playfield wax (Novus # 2) (675-0003-01) Standard Pinball (260-5000-00) Cleaning Cloth All Playfield Rubber Rings Spare Fuses	502-6002-L6 502-6002-L7
Guardians of the Galaxy LE/Premium Deluxe Maintenance Kit All standard kit items, plus: Flipper rebuild kits, Left and Right (500-6307-10,-00)	502-6003-L6 502-6003-L7
Guardians of the Galaxy LE Playfield Plastics Kit	803-5000-L6
Guardians of the Galaxy Premium Playfield Plastics Kit	803-5000-L7
Guardians of the Galaxy LE Playfield Decals Kit	802-5000-L6
Guardians of the Galaxy Premium Playfield Decals Kit	802-5000-L7
Guardians of the Galaxy LE Backbox Decal Left	820-78L6-01
Guardians of the Galaxy Premium Backbox Decal Left	820-78L7-01
Guardians of the Galaxy LE Backbox Decal Right	820-78L6-02
Guardians of the Galaxy Premium Backbox Decal Right	820-78L7-02
Guardians of the Galaxy LE Cabinet Decal Left	820-78L6-03
Guardians of the Galaxy Premium Cabinet Decal Left	820-78L7-03
Guardians of the Galaxy LE Cabinet Decal Right	820-78L6-04
Guardians of the Galaxy Premium Cabinet Decal Right	820-78L7-04
Guardians of the Galaxy LE Cabinet Decal Front	820-78L6-05
Guardians of the Galaxy Premium Cabinet Decal Front	820-78L7-05
Guardians of the Galaxy LE Playfield, Bare	830-5000-L6
Guardians of the Galaxy Premium Playfield, Bare	830-5000-L7
Guardians of the Galaxy LE Mirror Backglass	830-52L6-00
Guardians of the Galaxy Premium Translite Backglass	830-52L7-00

1.6 COMMON PARTS

Description	Part Number
8 oz Pinball Playfield wax (Novus # 2)	675-0003-01
Standard Pinball, 1-1/16 in	260-5000-00
Flipper Rebuild Kit Left (Standard)	500-6307-10
Flipper Base Plate Kit Left	515-6617-01
Flipper Rebuild Kit Right	500-6307-00
Flipper Base Plate Kit Right	515-6617-00

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2. SPIKE SYSTEM AND NODE GUIDE

2.1 SPIKE SYSTEM OVERVIEW

The SPIKE Pinball system is a rugged, distributed, and embedded platform custom-designed for the rigors of the pinball machine environment. SPIKE takes advantage of modern technologies to deliver an immersive pinball experience that supports modern features, reduces cabling, and increases serviceability and reliability.

A Stern Pinball machine based on the SPIKE system will have at least two nodes networked together with the SPIKE node bus, a custom industrial pinball control bus that is designed around industry standards and optimized for the pinball environment. The primary CPU node is networked to one or more input/output nodes over standard Category 5 UTP (unshielded twisted pair) ethernet cabling.

There are five primary types of nodes that are found in the game.

- CPU node (Node 0) - The primary node that controls other nodes in the system. Contains the primary game software for the system and provides SPIKE node bus power for other nodes.
- Cabinet 48V node (Node 1) - Specialized node with specific inputs and outputs for coin doors, tilt mechanisms, and other bottom-cabinet devices.
- 48V playfield node - Controls high power devices such as coils and flashers, and also supports a few switch and low-power outputs. Powered by the system 48V power supply.
- Light and switch node - High-density switch and low-power LED outputs, bus-powered from the node bus. These boards contain as many 32 switch inputs and light outputs.
- Node extensions - These sub-nodes add additional low-power input and outputs to a specific Power or I/O node and are connected with simple serial bus.

2.2 NODE BUS CABLING

The SPIKE node bus utilizes standard Ethernet-style RJ45 8-pin modular jacks, and off-the-shelf Category 5e or better ethernet cabling. The node bus is electrically different from Ethernet and does not utilize Ethernet or TCP/IP protocols or signaling standards. SPIKE nodes are not compatible with standard computer networking equipment.

CAUTION: Plugging a SPIKE Node or CPU board into a standard Ethernet port may damage one or both devices and void your warranty.

2.3 SYSTEM POWER

The SPIKE System is powered from an 48V DC power supply bus. Each SPIKE node converts this voltage to lower voltages required by the node and its specific components. A SPIKE 48V node typically controls high-power outputs such as game coil mechanisms and high-brightness LEDs. These powered nodes are supplied directly with 48V system power. SPIKE standard I/O nodes are low-power nodes that read switch inputs and output to standard-brightness LEDs. Standard I/O nodes use the node bus power, which is supplied by the main CPU node over the node bus modular jack connectors.

2.4 SPIKE NODE ADDRESSES

Each SPIKE node has a unique address ranging from 0 to 15. Not all addresses are used in all games. Nodes can be of the same part number, so the address is specified on the DIP switches on each node. When replacing a node, be certain that the correct address is set. Nodes can have 3-position and 4-position DIP switches. Refer to the appropriate table to set the address for each type of Node. The correct address for a node can be found in the SPIKE node reference section of the manual or in the game diagnostic software. Address 0 is reserved for the backbox CPU node, where the game software resides. Address 1 is reserved for the cabinet node, located inside the coin door. These two nodes do not have DIP switches as their address is not configurable.

Address	1	2	3
8	OFF	OFF	OFF
9	OFF	OFF	ON
10	OFF	ON	OFF
11	OFF	ON	ON
12	ON	OFF	OFF
13	ON	OFF	ON
14	ON	ON	OFF
15	ON	ON	ON

SPIKE node addresses for nodes with 3-position DIP switches. Addresses 0-7 are not used by SPIKE nodes with 3-position DIP switches.

Address	1	2	3	4
8	OFF	OFF	OFF	OFF
9	OFF	OFF	ON	OFF
10	OFF	ON	OFF	OFF
11	OFF	ON	ON	OFF
12	ON	OFF	OFF	OFF
13	ON	OFF	ON	OFF
14	ON	ON	OFF	OFF
15	ON	ON	ON	OFF

SPIKE node addresses for nodes with 4-position DIP switches. Addresses 0-7 are reserved for fixed-function nodes and do not require configuration.

SPIKE SYSTEM AND NODE GUIDE CONTINUED

2.5 SPIKE NODE PROGRAMMING

The SPIKE nodes are smart nodes that have on-board processors and run embedded code. The nodes are programmed automatically by the CPU node whenever software updates are installed to the CPU. When replacing a node, the CPU node will detect and update the node to the latest software with no user intervention. Always replace nodes with the power to the game turned OFF.

2.6 SPIKE SYSTEM TERMINOLOGY

MULTI GENERAL ILLUMINATION LIGHTING

General Illumination Lighting is two or more lights powered by one control source. These are often a number of LEDs connected in parallel and the system controls these as one large LED. A missing LED will not affect these circuits, however a shorted LED can cause the entire string of LEDs to turn off.

SINGLE LIGHTS

Single lights and LEDs are direct-controlled from SPIKE node boards. A common power source is grounded by individual transistors to turn individual LEDs on and off. Groups of LEDs, usually by node connector, share a common power source, so if a group of LEDs is out, check the wiring for the power source.

FLASHERS

SPIKE games treat flashers the same as single LEDs that draw more power. Flashers are controlled from the same circuits that power regular lights.

DRIVERS

A driver is a circuit that controls a high power-device such as a coil, magnet, or motor. Each device has a common 48V power source that is then connected to ground by a dedicated control transistor. Each driver is protected against shorting, static electricity, and over-current conditions. Take caution as 48V is always present on a device even when it is not energized.

OPTOS

Certain types of optical switches (“optos”) require external signal conditioning. For these optos, they will interface to a SPIKE node via an opto signal conditioning board. Other optical switches connect directly to the Spike node board.

System Protections

CAUTION: Unless explicitly directed by an Authorized Stern Repair technician, perform ALL work on your pinball machine with the power disabled!

INPUT/OUTPUT PROTECTIONS

SPIKE features built-in short-circuit, static electricity, and other protections to maximize reliability. If an LED, coil or other device shorts, it will be disabled but will not shut down the entire system in most circumstances. Groups of LEDs, coils, and switches often share common power supplies or other circuits, so it is possible that a bad device will affect the group of related devices and require removal or repair to fix the group. The system diagnostics will inform the technician of shorted or otherwise malfunctioning devices whenever possible. While the system is protected against permanent damage, it is strongly recommended to repair or replace these bad components as soon as possible to minimize downtime and maximize game earnings.

2.7 COMMON SPIKE NODE BOARDS

Description	Type	Part Number
SPIKE CPU Node	Node	509-1003-01
Cabinet Node	Node	520-6967-72
Playfield 48V Core-Driver Node	Node	520-7017-72
Trough Serial Opto Receiver Extension	Extension	520-7001-00

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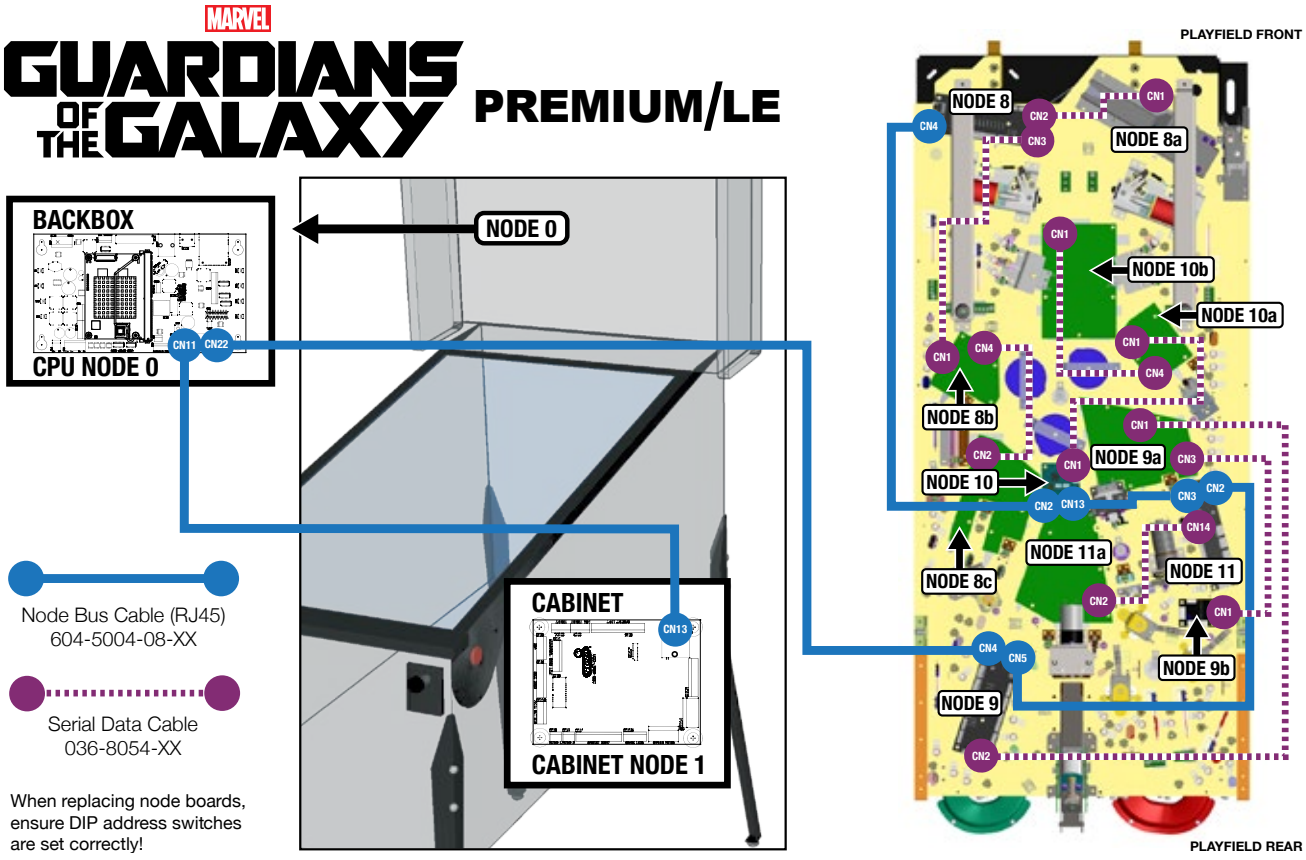
3. LIGHT, SWITCH, AND DRIVER REFERENCE



3.1 SPIKE NODE BOARDS

ID	DIP Address	Description	Location	Part Number
Node 0	n/a	SPIKE 2 CPU Node	Backbox	509-1003-01
Node 1	n/a	Cabinet Node	Cabinet	520-6967-72
Node 8	OFF-OFF-OFF-OFF	Playfield 48V Core-Driver Node	Lower Playfield	520-7017-72
8a	n/a	Trough Serial Opto Receiver Extension	Playfield	520-7001-00
8b	n/a	Lamp Board	Playfield	520-7081-00
8c	n/a	Lamp Board	Playfield	520-7077-00
Node 9	OFF-OFF-ON-OFF	Playfield 48V Core-Driver Node	Playfield	520-7017-72
9a	n/a	Lamp Board	Playfield	520-7078-00
9b	n/a	Serial Motor Driver board	Playfield	520-6996-00
Node 10	OFF-ON-OFF-OFF	SPI Only Node	Playfield	520-6976-72
10a	n/a	Lamp Board	Playfield	520-7079-00
10b	n/a	Lamp Board	Playfield	520-7080-00
Node 11	OFF-ON-ON	Playfield 48V 4 Coil Node	Playfield	520-6998-72
11a	n/a	Lamp Board	Playfield	520-7076-00

3.2 DRIVER REFERENCE

ID	Name	Node	Connector	Ret. Pin	Ret. Wire	Voltage	V+ Pin	V+ Color	Location	Type	Address	Part Number
1	Trough	8	CN8	7	ORG GRY	48V	1-4	GRY ORG	Playfield	Coil - 27-1500	8-DR-1	090-5004-ND
2	Auto Plunger	8	CN8	9	ORG WHT	48V	1-4	GRY ORG	Playfield	Coil - 23-800	8-DR-4	090-5001-ND
3	Left Flipper	8	CN8	6	ORG YEL	48V	1-4	GRY ORG	Playfield	Coil - 23-1100	8-DR-5	090-5030-ND
4	Right Flipper	8	CN8	5	ORG GRN	48V	1-4	GRY ORG	Playfield	Coil - 23-1100	8-DR-0	090-5030-ND
5	Left Slingshot	8	CN8	11	ORG BLU	48V	1-4	GRY ORG	Playfield	Coil - 26-1200	8-DR-3	090-5044-ND
6	Right Slingshot	8	CN8	10	ORG VIO	48V	1-4	GRY ORG	Playfield	Coil - 26-1200	8-DR-2	090-5044-ND
7	Shaker Motor	1	CN2	1	BLU	48V	5	RED	Cabinet	Motor	1-DR-0	041-5029-04
8												
9	Right Scoop	8	CN7	2	YEL BRN	48V	1	GRY ORG	Playfield	Coil - 26-1200	8-DR-8	090-5044-ND
10	Center Drop Target-Down	8	CN7	4	YEL RED	48V	1	GRY ORG	Playfield	Coil - 32-1800	8-DR-7	090-5031-00-ND
11	Center Drop Target-Up	8	CN7	3	YEL BLK	48V	1	GRY ORG	Playfield	Coil - 25-1240	8-DR-6	090-5034-ND
12												
13	Left Pop Bumper	9	CN8	10	ORG BLK	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-2	090-5044-ND
14	Right Pop Bumper	9	CN8	11	ORG BRN	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-3	090-5044-ND
15	Bottom Pop Bumper	9	CN8	9	ORG RED	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-4	090-5044-ND
16												
17	Orbit Control Gates-L/R	9	CN8	5	BLU YEL	48V	1-4	GRY BRN	Playfield	Coil - 32-1250	9-DR-0	511-7510-02 RT 090-5060-01-ND LT
18												
19	Left Magnet	9	CN8	6	BRN RED	48V	1-4	GRY BRN	Playfield	Coil - 22-650	9-DR-5	511-5065-ND
20	Groot-Trough Eject	9	CN8	7	YEL ORG	48V	1-4	GRY BRN	Playfield	Coil - 23-800	9-DR-1	090-5001-ND
21	Top Magnet	9	CN7	3	BRN BLK	48V	1	GRY BRN	Playfield	Coil - 22-650	9-DR-6	511-5065-ND
22	Right Magnet	11	CN5	3	BRN ORG	48V	4	GRY BLK	Playfield	Coil - 22-650	11-DR-0	511-5065-ND
23												
24	Kickback	9	CN7	2	YEL VIO	48V	1	GRY BRN	Playfield	Coil - 23-800	9-DR-8	090-5001-ND
25	Rocket Raccoon	9	CN7	4	YEL GRY	48V	1	GRY BRN	Playfield	Coil - 26-1200	9-DR-7	090-5044-ND
26												
27												
28												
29												
30												
31												
32												
33	Coin Meter	1	CN3	2	BLK	12V	1	RED	Cabinet	Digital Out	1-DR-2	500-9946-00
34	Ticket Meter	1	CN4	2	BLK	12V	1	RED	Cabinet	Digital Out	1-DR-3	500-9946-00
35	Ticket Dispenser	1	CN11	3		12V	1		Cabinet	Digital Out	1-DR-4	

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DRIVER REFERENCE CONTINUED

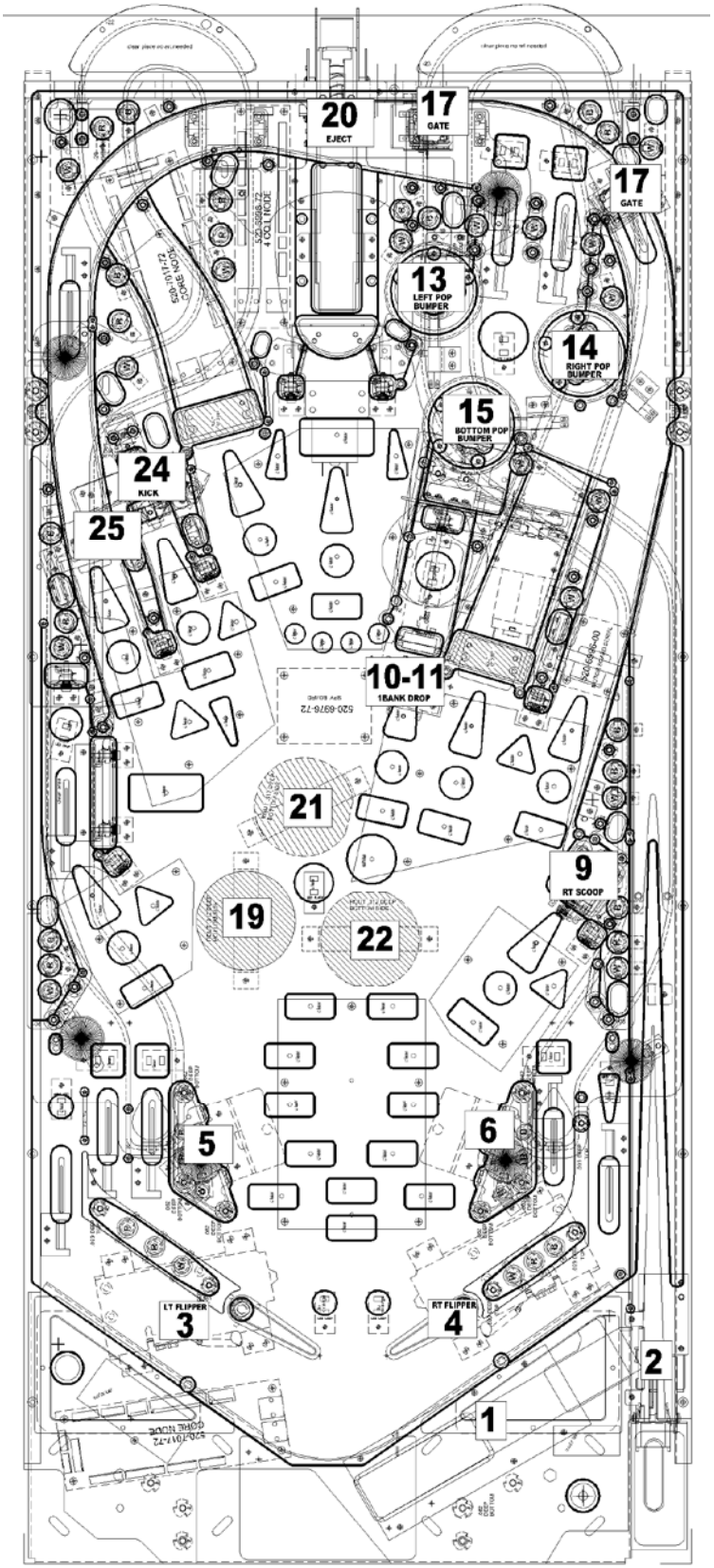

Figure 3.2.1. Playfield driver locations (top view).

3.3 SWITCH REFERENCE

ID	Name	Node	Node Ext	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
1	Left Outlane	8	-	CN11	4	LGN RED	11-12	BLK ORG	Playfield	Rollover	8-SW-17	500-9935-04
2	Left Return Lane-Left	8	-	CN11	5	LGN ORG	11-12	BLK ORG	Playfield	Rollover	8-SW-18	500-9935-04
3	Left Return Lane-Right	8	-	CN11	8	LGN VIO	11-12	BLK ORG	Playfield	Rollover	8-SW-21	500-9935-04
4												
5	Right Return Lane	8	-	CN11	6	LGN YEL	11-12	BLK ORG	Playfield	Rollover	8-SW-19	500-9935-03
6	Right Outlane	8	-	CN11	7	LGN BLU	11-12	BLK ORG	Playfield	Rollover	8-SW-20	500-9935-04
7	Left Slingshot	8	-	CN10	4	GRY BLU	8	BLK GRN	Playfield	Leaf	8-SW-30	180-5231-00
8	Right Slingshot	8	-	CN10	3	GRY VIO	8	BLK GRN	Playfield	Leaf	8-SW-29	180-5231-00
9	Left Flipper Button	8	-	CN9	4	GRY BRN	7	BLK GRN	Cabinet	Leaf	8-SW-25	180-5160-01
10	Right Flipper Button	8	-	CN9	3	GRY RED	7	BLK GRN	Cabinet	Leaf	8-SW-24	180-5160-01
11	Left Flipper EOS	8	-	CN10	6	GRY YEL	9	BLK GRN	Playfield	Leaf	8-SW-16	180-5149-00
12	Right Flipper EOS	8	-	CN10	5	GRY GRN	9	BLK GRN	Playfield	Leaf	8-SW-31	180-5149-00
13												
14												
15	Trough 6	8	8a	CN14	-		-		Playfield	Opto	8-SW-32	520-5344-00 tx 520-7001-00 rx
16	Trough 5	8	8a	CN14	-		-		Playfield	Opto	8-SW-33	520-5344-00 tx 520-7001-00 rx
17	Trough 4	8	8a	CN14	-		-		Playfield	Opto	8-SW-34	520-5344-00 tx 520-7001-00 rx
18	Trough 3	8	8a	CN14	-		-		Playfield	Opto	8-SW-35	520-5344-00 tx 520-7001-00 rx
19	Trough 2	8	8a	CN14	-		-		Playfield	Opto	8-SW-36	520-5344-00 tx 520-7001-00 rx
20	Trough 1	8	8a	CN14	-		-		Playfield	Opto	8-SW-37	520-5344-00 tx 520-7001-00 rx
21	Trough Jam	8	8a	CN14	-		-		Playfield	Opto	8-SW-38	520-5344-00 tx 520-7001-00 rx
22	Shooter Lane	8	-	CN10	2	GRY WHT	7	BLK GRN	Playfield	Micro	8-SW-28	180-5157-01
23												
24												
25												
26												
27												
28	Left Lane	9	-	CN11	2	TAN BLK	11/12	BLK BLU	Playfield	Rollover	9-SW-26	500-9935-04
29	Left Lane Target	9	-	CN11	3	TAN RED	11/12	BLK BLU	Playfield	Leaf, Target	9-SW-27	515-9783-00-00
30	Guardians Target-Top	9	-	CN11	7	TAN BLU	11/12	BLK BLU	Playfield	Leaf, Target	9-SW-20	511-9979-00
31	Guardians Target-Bottom	9	-	CN11	8	TAN VIO	11/12	BLK BLU	Playfield	Leaf, Target	9-SW-21	511-9979-00
32												
33												
34	Left Spinner	9	-	CN11	9	TAN	11/12	BLK BLU	Playfield	Micro	9-SW-22	180-5010-04
35	Left Orbit	9	-	CN12	2	WHT BRN	10	BLK VIO	Playfield	Rollover	9-SW-8	500-9935-04
36	Kickback Opto	9	-	CN11	10	TAN WHT	11/12	BLK BLU	Playfield	Opto	9-SW-23	515-0215-00 tx 515-0215-01 rx
37	Left Ramp Exit	9	-	CN12	6	WHT GRN	10	BLK VIO	Playfield	Opto	9-SW-12	515-0215-00 tx 515-0215-01 rx
38												
39	Groot Target-Left	9	-	CN12	4	WHT ORG	10	BLK VIO	Playfield	Leaf, Target	9-SW-10	515-9785-00-00
40	Groot Target-Right	9	-	CN12	5	WHT YEL	10	BLK VIO	Playfield	Leaf, Target	9-SW-11	515-9785-00-00
41	Groot Opto	9	-	CN13	2	PNK BLK	10	BLK GRY	Playfield	Opto	9-SW-0	515-0215-00 tx 515-0215-01 rx

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SWITCH REFERENCE CONTINUED

ID	Name	Node	Node Ext	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
42	Groot Trough 1	9	-	CN13	3	PNK BRN	10	BLK GRY	Playfield	Opto	9-SW-1	520-7064-00 rx 520-7065-00 tx
43	Groot Trough 2	9	-	CN13	4	PNK RED	10	BLK GRY	Playfield	Opto	9-SW-2	520-7064-00 rx 520-7065-00 tx
44	Groot Trough 3	9	-	CN13	5	PNK ORG	10	BLK GRY	Playfield	Opto	9-SW-3	520-7064-00 rx 520-7065-00 tx
45	Groot Trough 4	9	-	CN13	6	PNK YEL	10	BLK GRY	Playfield	Opto	9-SW-4	520-7064-00 rx 520-7065-00 tx
46	Groot Motor Away	9	-	CN13	7	PNK GRN	10	BLK GRY	Playfield	Micro	9-SW-5	180-5119-02
47	Groot Motor Home	9	-	CN13	8	PNK BLU	10	BLK GRY	Playfield	Micro	9-SW-6	180-5119-02
48												
49	Center Drop Target	8	-	CN12	3	WHT RED	10	BLK RED	Playfield	Leaf, Target	8-SW-9	520-5252-01
50	Orb Standup Target	8	-	CN12	6	WHT GRN	10	BLK RED	Playfield	Leaf, Target	8-SW-12	515-9783-00-00
51	Orb Motor Home	9	-	CN12	8	WHT VIO	10	BLK VIO	Playfield	Micro	9-SW-14	180-5010-02
52	Orb Motor Away	9	-	CN12	9	WHT GRY	10	BLK VIO	Playfield	Micro	9-SW-15	180-5010-02
53												
54	Right Spinner	8	-	CN12	7	WHT BLU	10	BLK RED	Playfield	Micro	8-SW-13	180-5010-04
55	Right Orbit	9	-	CN12	3	WHT RED	10	BLK VIO	Playfield	Rollover	9-SW-9	500-9935-03
56	Right Ramp Exit	9	-	CN12	7	WHT BLU	10	BLK VIO	Playfield	Opto	9-SW-13	515-0215-00 tx 515-0215-01 rx
57												
58	Left Pop Bumper	9	-	CN10	2	GRY BLK	7/8/9	BLK YEL	Playfield	Leaf	9-SW-28	180-5232-00
59	Right Pop Bumper	9	-	CN10	3	GRY BRN	7/8/9	BLK YEL	Playfield	Leaf	9-SW-29	180-5232-00
60	Bottom Pop Bumper	9	-	CN10	4	GRY RED	7/8/9	BLK YEL	Playfield	Leaf	9-SW-30	180-5232-00
61												
62	Top Lane-Left	9	-	CN10	5	GRY ORG	7/8/9	BLK YEL	Playfield	Rollover	9-SW-31	500-9935-04
63	Top Lane-Right	9	-	CN10	6	GRY YEL	7/8/9	BLK YEL	Playfield	Rollover	9-SW-16	500-9935-04
64												
65	Hadron Enforcer Target 1	9	-	CN11	4	TAN ORG	11/12	BLK BLU	Playfield	Leaf, Target	9-SW-17	515-9785-00-00
66	Hadron Enforcer Target 2	9	-	CN11	5	TAN YEL	11/12	BLK BLU	Playfield	Leaf, Target	9-SW-18	515-9785-00-00
67	Hadron Enforcer Target 3	9	-	CN11	6	TAN GRN	11/12	BLK BLU	Playfield	Leaf, Target	9-SW-19	515-9785-00-00
68	Hadron Enforcer Target 4	8	-	CN12	8	WHT VIO	10	BLK RED	Playfield	Leaf, Target	8-SW-14	515-9785-00-00
69	Hadron Enforcer Target 5	8	-	CN12	9	WHT GRY	10	BLK RED	Playfield	Leaf, Target	8-SW-15	515-9785-00-00
70												
71	Right Scoop	8	-	CN12	2	WHT BRN	10	BLK RED	Playfield	Micro	8-SW-8	180-5209-00
72												
73												
74												
75												
76												
77												
78												
79												
80	Lockdown Button	1	-	CN7	8	TAN WHT	5	BLK WHT	Cabinet	Leaf	1-SW-2	180-5218-00
81												
82												
83												
84	Start Button	1	-	CN6	10	GRY	5	BLK WHT	Cabinet	Micro	1-SW-11	180-5174-00

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SWITCH REFERENCE CONTINUED

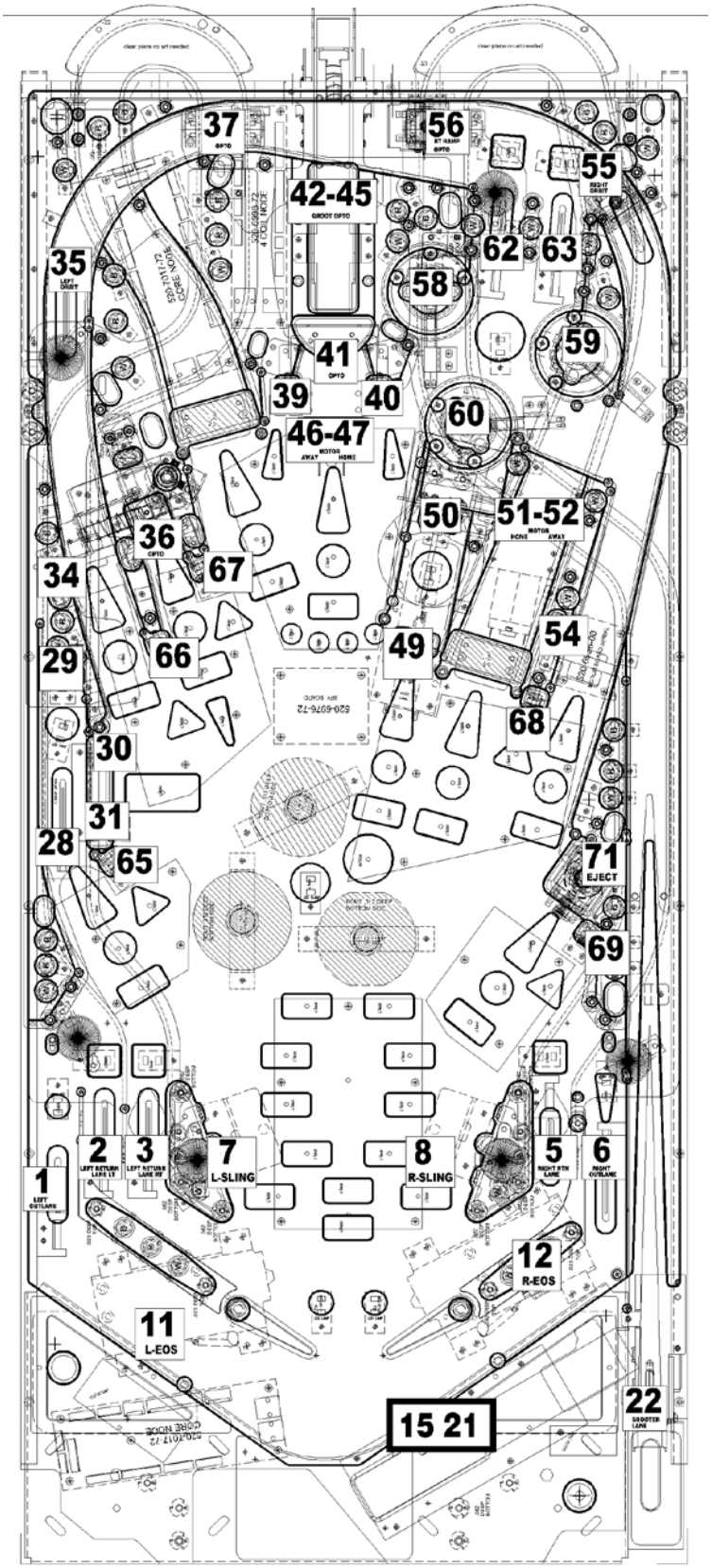

Figure 3.3.1. Playfield switch locations (top view).

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SWITCH REFERENCE CONTINUED

ID	Name	Node	Node Ext	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
85	Tournament Start Button	1	-	CN6	9	GRY WHT	5	BLK WHT	Cabinet	Micro	1-SW-12	180-5174-00
86												
87												
88												
89												
90	Left Coin	1	-	CN5	9	PNK BRN	3	BLK	Cabinet	Micro	1-SW-16	
91	Right Coin	1	-	CN5	7	PNK ORG	3	BLK	Cabinet	Micro	1-SW-18	
92	Center Coin	1	-	CN5	8	PNK RED	3	BLK	Cabinet	Micro	1-SW-17	
93	Fourth Coin	1	-	CN5	6		-		Cabinet	-	1-SW-19	
94	Fifth Coin	1	-	CN5	5		-		Cabinet	-	1-SW-20	
95	Tilt Pendulum	1	-	CN6	7	WHT	5	BLK WHT	Cabinet	Plumb Bob	1-SW-14	516-0007-00
96	Sixth Coin	1	-	CN9	5		-		Cabinet	-	1-SW-21	
97	Ticket Notch	1	-	CN11	5		-		Cabinet	-	1-SW-8	
98	Slam Tilt	1	-	CN5	4	LGN RED	3	BLK	Cabinet	-	1-SW-22	
99												
100												
C1	DIP 1	0	-	-	-		-		CPU Node		0-SW-0	-
C10	Service Plus	0	-	CN25	3	LGN VIO	6	BLK	Coin Door		0-SW-9	180-5192-02
C11	Service Minus	0	-	CN25	2	LGN BLU	6	BLK	Coin Door		0-SW-10	180-5192-02
C12	Service Back	0	-	CN25	1	LGN BLK	6	BLK	Coin Door		0-SW-11	180-5192-00
C17	Headphone Detect	0	-	-	-	-	-	-	Coin Door		0-SW-16	-
C18	Headphone Kit Cable Detect	0	-	CN3	5	BLK	4	BLK	CPU Node		0-SW-17	-
C19	Volume Encoder 1	0	-	CN3	6	WHT	1	DRAIN	CPU Node		0-SW-18	-
C2	DIP 2	0	-	-	-		-		CPU Node		0-SW-1	-
C20	Volume Encoder 2	0	-	CN3	7	GRN	1	DRAIN	CPU Node		0-SW-19	-
C24	DC Sense	0	-	CN7	4	GRY RED	1	BLK	-		0-SW-23	-
C3	DIP 3	0	-	-	-		-		CPU Node		0-SW-2	-
C4	DIP 4	0	-	-	-		-		CPU Node		0-SW-3	-
C5	DIP 5	0	-	-	-		-		CPU Node		0-SW-4	-
C6	DIP 6	0	-	-	-		-		CPU Node		0-SW-5	-
C7	DIP 7	0	-	-	-		-		CPU Node		0-SW-6	-
C8	DIP 8	0	-	-	-		-		CPU Node		0-SW-7	-
C9	Service Select	0	-	CN25	4	LGN GRY	6	BLK	Coin Door		0-SW-8	180-5192-04

3.4 LIGHT REFERENCE

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
1	Coin Enable	1	-	CN8	6	BLK GRY	2	GRY RED	Coin Door	Digital Out		1-LP-0	
2	Start Button	1	-	CN6	3	YEL BRN	1	RED	Cabinet	Feature	White	1-LP-2	112-5033-08
3	Tournament Start	1	-	CN6	2	YEL RED	1	RED	Cabinet	Feature	White	1-LP-3	112-5033-08
4	Lockdown Button-RED	1	-	CN7	2	RED WHT	1	RED	Cabinet	Feature	RGB	1-LP-5	520-5333-00
5	Lockdown Button-GRN	1	-	CN7	3	GRN WHT	1	RED	Cabinet	Feature	RGB	1-LP-4	520-5333-00
6	Lockdown Button-BLU	1	-	CN7	4	BLU WHT	1	RED	Cabinet	Feature	RGB	1-LP-7	520-5333-00
7													
8													
9													
10													
11	Left Outlane-RED	8	b	CN2	7	RED GRY	1/2	RED	Playfield	Feature	RGB	8-LP-11	520-5333-00
12	Left Outlane-GRN	8	b	CN2	6	GRN GRY	1/2	RED	Playfield	Feature	RGB	8-LP-12	520-5333-00
13	Left Outlane-BLU	8	b	CN2	5	BLU GRY	1/2	RED	Playfield	Feature	RGB	8-LP-13	520-5333-00
14	Left Return Lane-Left-RED	8	b	CN2	10	RED VIO	1/2	RED	Playfield	Feature	RGB	8-LP-8	520-5333-00
15	Left Return Lane-Left-GRN	8	b	CN2	9	GRN VIO	1/2	RED	Playfield	Feature	RGB	8-LP-9	520-5333-00
16	Left Return Lane-Left-BLU	8	b	CN3	8	BLU VIO	1/2	RED	Playfield	Feature	RGB	8-LP-10	520-5333-00
17	Left Return Lane-Right-RED	8	b	CN3	5	RED YEL	1	RED	Playfield	Feature	RGB	8-LP-19	520-5333-00
18	Left Return Lane-Right-GRN	8	b	CN3	4	GRN YEL	1	RED	Playfield	Feature	RGB	8-LP-20	520-5333-00
19	Left Return Lane-Right-BLU	8	b	CN3	3	BLU YEL	1	RED	Playfield	Feature	RGB	8-LP-21	520-5333-00
20	Antiquities Shop-RED	10	b	-	LED13	-	-	-	Playfield	Feature	RGB	10-LP-52	520-7080-00
21	Antiquities Shop-GRN	10	b	-	LED13	-	-	-	Playfield	Feature	RGB	10-LP-53	520-7080-00
22	Antiquities Shop-BLU	10	b	-	LED13	-	-	-	Playfield	Feature	RGB	10-LP-54	520-7080-00
23	Pod Chase-RED	10	b	-	LED12	-	-	-	Playfield	Feature	RGB	10-LP-49	520-7080-00
24	Pod Chase-GRN	10	b	-	LED12	-	-	-	Playfield	Feature	RGB	10-LP-50	520-7080-00
25	Pod Chase-BLU	10	b	-	LED12	-	-	-	Playfield	Feature	RGB	10-LP-51	520-7080-00
26	Sanctuary-RED	10	b	-	LED9	-	-	-	Playfield	Feature	RGB	10-LP-40	520-7080-00
27	Sanctuary-GRN	10	b	-	LED9	-	-	-	Playfield	Feature	RGB	10-LP-41	520-7080-00
28	Sanctuary-BLU	10	b	-	LED9	-	-	-	Playfield	Feature	RGB	10-LP-42	520-7080-00
29	Yaka Arrow-RED	10	b	-	LED7	-	-	-	Playfield	Feature	RGB	10-LP-34	520-7080-00
30	Yaka Arrow-GRN	10	b	-	LED7	-	-	-	Playfield	Feature	RGB	10-LP-35	520-7080-00
31	Yaka Arrow-BLU	10	b	-	LED7	-	-	-	Playfield	Feature	RGB	10-LP-36	520-7080-00
32	Sibling Rivalry-RED	10	b	-	LED14	-	-	-	Playfield	Feature	RGB	10-LP-55	520-7080-00
33	Sibling Rivalry-GRN	10	b	-	LED14	-	-	-	Playfield	Feature	RGB	10-LP-56	520-7080-00
34	Sibling Rivalry-BLU	10	b	-	LED14	-	-	-	Playfield	Feature	RGB	10-LP-57	520-7080-00
35	Escape Kyln-RED	10	b	-	LED16	-	-	-	Playfield	Feature	RGB	10-LP-61	520-7080-00
36	Escape Kyln-GRN	10	b	-	LED16	-	-	-	Playfield	Feature	RGB	10-LP-62	520-7080-00
37	Escape Kyln-BLU	10	b	-	LED16	-	-	-	Playfield	Feature	RGB	10-LP-63	520-7080-00
38	Knowhere-RED	10	b	-	LED15	-	-	-	Playfield	Feature	RGB	10-LP-58	520-7080-00
39	Knowhere-GRN	10	b	-	LED15	-	-	-	Playfield	Feature	RGB	10-LP-59	520-7080-00
40	Knowhere-BLU	10	b	-	LED15	-	-	-	Playfield	Feature	RGB	10-LP-60	520-7080-00
41	Quills Quest-RED	10	b	-	LED10	-	-	-	Playfield	Feature	RGB	10-LP-43	520-7080-00
42	Quills Quest-GRN	10	b	-	LED10	-	-	-	Playfield	Feature	RGB	10-LP-44	520-7080-00
43	Quills Quest-BLU	10	b	-	LED10	-	-	-	Playfield	Feature	RGB	10-LP-45	520-7080-00
44	Immolation Initiative-RED	10	b	-	LED11	-	-	-	Playfield	Feature	RGB	10-LP-46	520-7080-00
45	Immolation Initiative-GRN	10	b	-	LED11	-	-	-	Playfield	Feature	RGB	10-LP-47	520-7080-00
46	Immolation Initiative-BLU	10	b	-	LED11	-	-	-	Playfield	Feature	RGB	10-LP-48	520-7080-00
47	Orb Multiball-Bottom-RED	10	b	-	LED8	-	-	-	Playfield	Feature	RGB	10-LP-37	520-7080-00
48	Orb Multiball-Bottom-GRN	10	b	-	LED8	-	-	-	Playfield	Feature	RGB	10-LP-38	520-7080-00
49	Orb Multiball-Bottom-BLU	10	b	-	LED8	-	-	-	Playfield	Feature	RGB	10-LP-39	520-7080-00
50	Save Xandar-RED	10	b	-	LED1	-	-	-	Playfield	Feature	RGB	10-LP-24	520-7080-00
51	Save Xandar-GRN	10	b	-	LED1	-	-	-	Playfield	Feature	RGB	10-LP-25	520-7080-00

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LIGHT REFERENCE CONTINUED

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
52	Save Xandar-BLU	10	b	-	LED1	-	-	-	Playfield	Feature	RGB	10-LP-26	520-7080-00
53	Groot Multiball-Bottom-RED	10	b	-	LED6	-	-	-	Playfield	Feature	RGB	10-LP-31	520-7080-00
54	Groot Multiball-Bottom-GRN	10	b	-	LED6	-	-	-	Playfield	Feature	RGB	10-LP-32	520-7080-00
55	Groot Multiball-Bottom-BLU	10	b	-	LED6	-	-	-	Playfield	Feature	RGB	10-LP-33	520-7080-00
56	Shoot Again (x2)	10	b	CN2	4	ORG YEL	1	RED	Playfield	Feature	White	10-LP-28	520-5307-00
57													
58													
59	Right Return Lane-RED	10	a	CN3	10	RED VIO	1/2	RED	Playfield	Feature	RGB	10-LP-7	520-5333-00
60	Right Return Lane-GRN	10	a	CN3	9	GRN VIO	1/2	RED	Playfield	Feature	RGB	10-LP-8	520-5333-00
61	Right Return Lane-BLU	10	a	CN3	8	BLU VIO	1/2	RED	Playfield	Feature	RGB	10-LP-9	520-5333-00
62	Right Outlane-RED	10	a	CN3	7	RED GRY	1/2	RED	Playfield	Feature	RGB	10-LP-10	520-5333-00
63	Right Outlane-GRN	10	a	CN3	6	GRN GRY	1/2	RED	Playfield	Feature	RGB	10-LP-11	520-5333-00
64	Right Outlane-BLU	10	a	CN3	5	BLU GRY	1/2	RED	Playfield	Feature	RGB	10-LP-12	520-5333-00
65													
66													
67													
68													
69													
70													
71	Left Lane Arrow-RED	8	b	-	LED9	-	-	-	Playfield	Feature	RGB	8-LP-16	520-7081-00
72	Left Lane Arrow-GRN	8	b	-	LED9	-	-	-	Playfield	Feature	RGB	8-LP-17	520-7081-00
73	Left Lane Arrow-BLU	8	b	-	LED9	-	-	-	Playfield	Feature	RGB	8-LP-18	520-7081-00
74	Left Lane X-RED	8	b	-	LED15	-	-	-	Playfield	Feature	RGB	8-LP-26	520-7081-00
75	Left Lane X-GRN	8	b	-	LED15	-	-	-	Playfield	Feature	RGB	8-LP-27	520-7081-00
76	Left Lane X-BLU	8	b	-	LED15	-	-	-	Playfield	Feature	RGB	8-LP-28	520-7081-00
77	Left Lane Rectangle-RED	8	b	-	LED14	-	-	-	Playfield	Feature	RGB	8-LP-23	520-7081-00
78	Left Lane Rectangle-GRN	8	b	-	LED14	-	-	-	Playfield	Feature	RGB	8-LP-24	520-7081-00
79	Left Lane Rectangle-BLU	8	b	-	LED14	-	-	-	Playfield	Feature	RGB	8-LP-25	520-7081-00
80													
81	Guardians-RED	8	c	-	LED3	-	-	-	Playfield	Feature	RGB	8-LP-34	520-7077-00
82	Guardians-GRN	8	c	-	LED3	-	-	-	Playfield	Feature	RGB	8-LP-35	520-7077-00
83	Guardians-BLU	8	c	-	LED3	-	-	-	Playfield	Feature	RGB	8-LP-36	520-7077-00
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
96													
97													
98													
99													
100	Left Orbit Arrow-RED	8	c	-	LED5	-	-	-	Playfield	Feature	RGB	8-LP-40	520-7077-00
101	Left Orbit Arrow-GRN	8	c	-	LED5	-	-	-	Playfield	Feature	RGB	8-LP-41	520-7077-00
102	Left Orbit Arrow-BLU	8	c	-	LED5	-	-	-	Playfield	Feature	RGB	8-LP-42	520-7077-00

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LIGHT REFERENCE CONTINUED

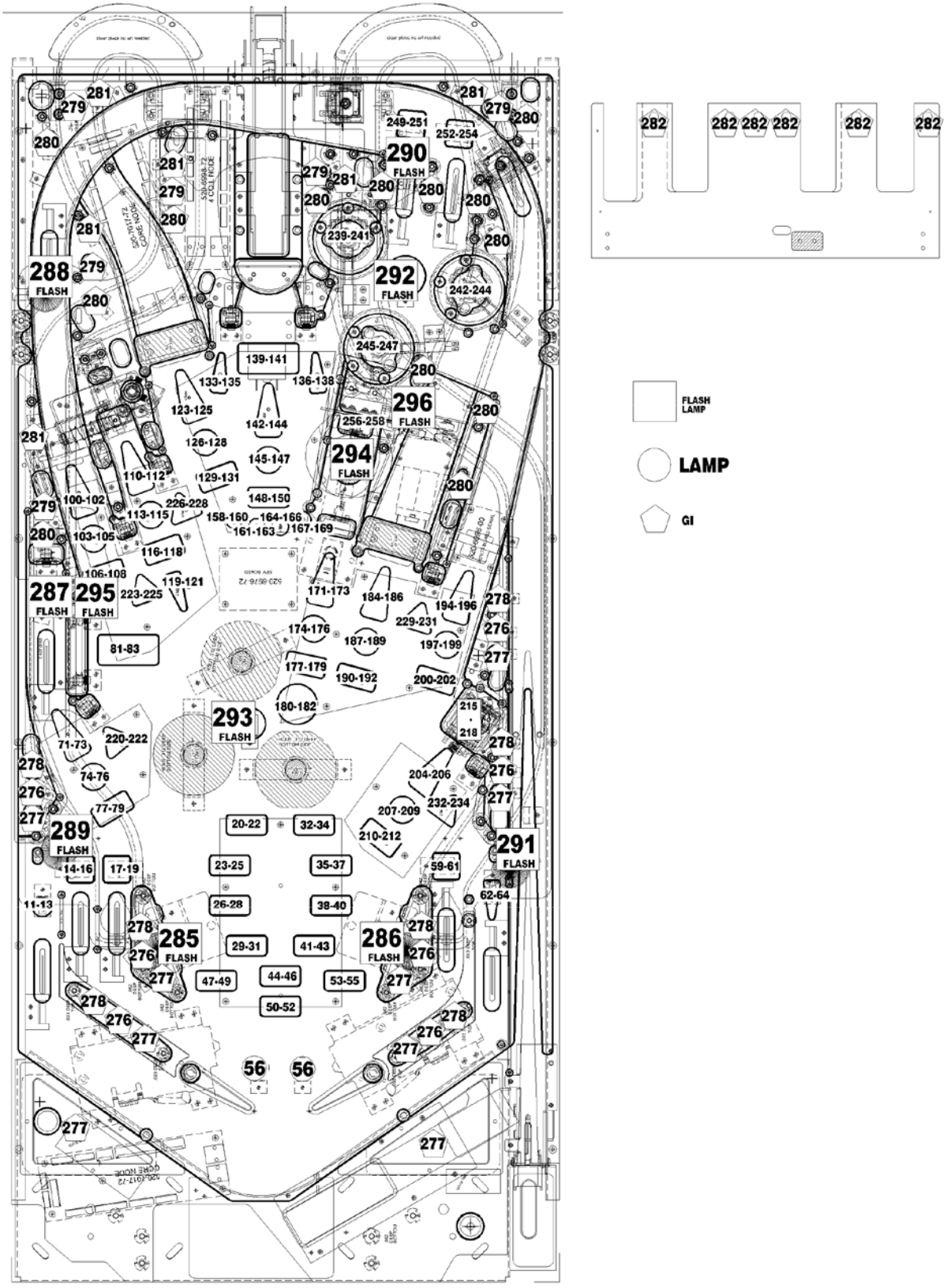

Figure 3.4.1. Playfield light locations (top view).

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LIGHT REFERENCE CONTINUED

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
103	Left Orbit X-RED	8	c	-	LED6	-	-	-	Playfield	Feature	RGB	8-LP-43	520-7077-00
104	Left Orbit X-GRN	8	c	-	LED6	-	-	-	Playfield	Feature	RGB	8-LP-44	520-7077-00
105	Left Orbit X-BLU	8	c	-	LED6	-	-	-	Playfield	Feature	RGB	8-LP-45	520-7077-00
106	Left Orbit Rectangle-RED	8	c	-	LED7	-	-	-	Playfield	Feature	RGB	8-LP-46	520-7077-00
107	Left Orbit Rectangle-GRN	8	c	-	LED7	-	-	-	Playfield	Feature	RGB	8-LP-47	520-7077-00
108	Left Orbit Rectangle-BLU	8	c	-	LED7	-	-	-	Playfield	Feature	RGB	8-LP-48	520-7077-00
109													
110	Rocket Arrow-RED	8	c	-	LED12	-	-	-	Playfield	Feature	RGB	8-LP-61	520-7077-00
111	Rocket Arrow-GRN	8	c	-	LED12	-	-	-	Playfield	Feature	RGB	8-LP-62	520-7077-00
112	Rocket Arrow-BLU	8	c	-	LED12	-	-	-	Playfield	Feature	RGB	8-LP-63	520-7077-00
113	Rocket X-RED	8	c	-	LED11	-	-	-	Playfield	Feature	RGB	8-LP-58	520-7077-00
114	Rocket X-GRN	8	c	-	LED11	-	-	-	Playfield	Feature	RGB	8-LP-59	520-7077-00
115	Rocket X-BLU	8	c	-	LED11	-	-	-	Playfield	Feature	RGB	8-LP-60	520-7077-00
116	Rocket Rectangle-RED	8	c	-	LED8	-	-	-	Playfield	Feature	RGB	8-LP-49	520-7077-00
117	Rocket Rectangle-GRN	8	c	-	LED8	-	-	-	Playfield	Feature	RGB	8-LP-50	520-7077-00
118	Rocket Rectangle-BLU	8	c	-	LED8	-	-	-	Playfield	Feature	RGB	8-LP-51	520-7077-00
119	Rocket Multiball-RED	8	c	-	LED10	-	-	-	Playfield	Feature	RGB	8-LP-55	520-7077-00
120	Rocket Multiball-GRN	8	c	-	LED10	-	-	-	Playfield	Feature	RGB	8-LP-56	520-7077-00
121	Rocket Multiball-BLU	8	c	-	LED10	-	-	-	Playfield	Feature	RGB	8-LP-57	520-7077-00
122													
123	Left Ramp Arrow-RED	11	a	-	LED6	-	-	-	Playfield	Feature	RGB	11-LP-29	520-7076-00
124	Left Ramp Arrow-GRN	11	a	-	LED6	-	-	-	Playfield	Feature	RGB	11-LP-30	520-7076-00
125	Left Ramp Arrow-BLU	11	a	-	LED6	-	-	-	Playfield	Feature	RGB	11-LP-31	520-7076-00
126	Left Ramp X-RED	11	a	-	LED7	-	-	-	Playfield	Feature	RGB	11-LP-32	520-7076-00
127	Left Ramp X-GRN	11	a	-	LED7	-	-	-	Playfield	Feature	RGB	11-LP-33	520-7076-00
128	Left Ramp X-BLU	11	a	-	LED7	-	-	-	Playfield	Feature	RGB	11-LP-34	520-7076-00
129	Left Ramp Rectangle-RED	11	a	-	LED8	-	-	-	Playfield	Feature	RGB	11-LP-35	520-7076-00
130	Left Ramp Rectangle-GRN	11	a	-	LED8	-	-	-	Playfield	Feature	RGB	11-LP-36	520-7076-00
131	Left Ramp Rectangle-BLU	11	a	-	LED8	-	-	-	Playfield	Feature	RGB	11-LP-37	520-7076-00
132													
133	Groot Target-Left-RED	11	a	-	LED4	-	-	-	Playfield	Feature	RGB	11-LP-23	520-7076-00
134	Groot Target-Left-GRN	11	a	-	LED4	-	-	-	Playfield	Feature	RGB	11-LP-24	520-7076-00
135	Groot Target-Left-BLU	11	a	-	LED4	-	-	-	Playfield	Feature	RGB	11-LP-25	520-7076-00
136	Groot Target-Right-RED	11	a	-	LED2	-	-	-	Playfield	Feature	RGB	11-LP-17	520-7076-00
137	Groot Target-Right-GRN	11	a	-	LED2	-	-	-	Playfield	Feature	RGB	11-LP-18	520-7076-00
138	Groot Target-Right-BLU	11	a	-	LED2	-	-	-	Playfield	Feature	RGB	11-LP-19	520-7076-00
139	Groot Multiball-RED	11	a	-	LED3	-	-	-	Playfield	Feature	RGB	11-LP-20	520-7076-00
140	Groot Multiball-GRN	11	a	-	LED3	-	-	-	Playfield	Feature	RGB	11-LP-21	520-7076-00
141	Groot Multiball-BLU	11	a	-	LED3	-	-	-	Playfield	Feature	RGB	11-LP-22	520-7076-00
142	Groot Arrow-RED	11	a	-	LED5	-	-	-	Playfield	Feature	RGB	11-LP-26	520-7076-00
143	Groot Arrow-GRN	11	a	-	LED5	-	-	-	Playfield	Feature	RGB	11-LP-27	520-7076-00
144	Groot Arrow-BLU	11	a	-	LED5	-	-	-	Playfield	Feature	RGB	11-LP-28	520-7076-00
145	Groot X-RED	11	a	-	LED9	-	-	-	Playfield	Feature	RGB	11-LP-38	520-7076-00
146	Groot X-GRN	11	a	-	LED9	-	-	-	Playfield	Feature	RGB	11-LP-39	520-7076-00
147	Groot X-BLU	11	a	-	LED9	-	-	-	Playfield	Feature	RGB	11-LP-40	520-7076-00
148	Groot Rectangle-RED	11	a	-	LED10	-	-	-	Playfield	Feature	RGB	11-LP-41	520-7076-00
149	Groot Rectangle-GRN	11	a	-	LED10	-	-	-	Playfield	Feature	RGB	11-LP-42	520-7076-00
150	Groot Rectangle-BLU	11	a	-	LED10	-	-	-	Playfield	Feature	RGB	11-LP-43	520-7076-00
151													
152													
153													

Continued on next page...

LIGHT REFERENCE CONTINUED

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
154													
155													
156													
157													
158	Lock 1-RED	11	a	-	LED11	-	-	-	Playfield	Feature	RGB	11-LP-44	520-7076-00
159	Lock 1-GRN	11	a	-	LED11	-	-	-	Playfield	Feature	RGB	11-LP-45	520-7076-00
160	Lock 1-BLU	11	a	-	LED11	-	-	-	Playfield	Feature	RGB	11-LP-46	520-7076-00
161	Lock 2-RED	11	a	-	LED12	-	-	-	Playfield	Feature	RGB	11-LP-47	520-7076-00
162	Lock 2-GRN	11	a	-	LED12	-	-	-	Playfield	Feature	RGB	11-LP-48	520-7076-00
163	Lock 2-BLU	11	a	-	LED12	-	-	-	Playfield	Feature	RGB	11-LP-49	520-7076-00
164	Lock 3-RED	11	a	-	LED13	-	-	-	Playfield	Feature	RGB	11-LP-50	520-7076-00
165	Lock 3-GRN	11	a	-	LED13	-	-	-	Playfield	Feature	RGB	11-LP-51	520-7076-00
166	Lock 3-BLU	11	a	-	LED13	-	-	-	Playfield	Feature	RGB	11-LP-52	520-7076-00
167	Lock 4-RED	11	a	-	LED14	-	-	-	Playfield	Feature	RGB	11-LP-53	520-7076-00
168	Lock 4-GRN	11	a	-	LED14	-	-	-	Playfield	Feature	RGB	11-LP-54	520-7076-00
169	Lock 4-BLU	11	a	-	LED14	-	-	-	Playfield	Feature	RGB	11-LP-55	520-7076-00
170													
171	Orb Arrow-RED	9	a	-	LED12	-	-	-	Playfield	Feature	RGB	9-LP-33	520-7078-00
172	Orb Arrow-GRN	9	a	-	LED12	-	-	-	Playfield	Feature	RGB	9-LP-34	520-7078-00
173	Orb Arrow-BLU	9	a	-	LED12	-	-	-	Playfield	Feature	RGB	9-LP-35	520-7078-00
174	Orb X-RED	9	a	-	LED13	-	-	-	Playfield	Feature	RGB	9-LP-36	520-7078-00
175	Orb X-GRN	9	a	-	LED13	-	-	-	Playfield	Feature	RGB	9-LP-37	520-7078-00
176	Orb X-BLU	9	a	-	LED13	-	-	-	Playfield	Feature	RGB	9-LP-38	520-7078-00
177	Orb Rectangle-RED	9	a	-	LED14	-	-	-	Playfield	Feature	RGB	9-LP-39	520-7078-00
178	Orb Rectangle-GRN	9	a	-	LED14	-	-	-	Playfield	Feature	RGB	9-LP-40	520-7078-00
179	Orb Rectangle-BLU	9	a	-	LED14	-	-	-	Playfield	Feature	RGB	9-LP-41	520-7078-00
180	Orb Multiball-RED	9	a	-	LED15	-	-	-	Playfield	Feature	RGB	9-LP-42	520-7078-00
181	Orb Multiball-GRN	9	a	-	LED15	-	-	-	Playfield	Feature	RGB	9-LP-43	520-7078-00
182	Orb Multiball-BLU	9	a	-	LED15	-	-	-	Playfield	Feature	RGB	9-LP-44	520-7078-00
183													
184	Right Ramp Arrow-RED	9	a	-	LED9	-	-	-	Playfield	Feature	RGB	9-LP-24	520-7078-00
185	Right Ramp Arrow-GRN	9	a	-	LED9	-	-	-	Playfield	Feature	RGB	9-LP-25	520-7078-00
186	Right Ramp Arrow-BLU	9	a	-	LED9	-	-	-	Playfield	Feature	RGB	9-LP-26	520-7078-00
187	Right Ramp X-RED	9	a	-	LED10	-	-	-	Playfield	Feature	RGB	9-LP-27	520-7078-00
188	Right Ramp X-GRN	9	a	-	LED10	-	-	-	Playfield	Feature	RGB	9-LP-28	520-7078-00
189	Right Ramp X-BLU	9	a	-	LED10	-	-	-	Playfield	Feature	RGB	9-LP-29	520-7078-00
190	Right Ramp Rectangle-RED	9	a	-	LED11	-	-	-	Playfield	Feature	RGB	9-LP-30	520-7078-00
191	Right Ramp Rectangle-GRN	9	a	-	LED11	-	-	-	Playfield	Feature	RGB	9-LP-31	520-7078-00
192	Right Ramp Rectangle-BLU	9	a	-	LED11	-	-	-	Playfield	Feature	RGB	9-LP-32	520-7078-00
193													
194	Right Orbit Arrow-RED	9	a	-	LED6	-	-	-	Playfield	Feature	RGB	9-LP-15	520-7078-00
195	Right Orbit Arrow-GRN	9	a	-	LED6	-	-	-	Playfield	Feature	RGB	9-LP-16	520-7078-00
196	Right Orbit Arrow-BLU	9	a	-	LED6	-	-	-	Playfield	Feature	RGB	9-LP-17	520-7078-00
197	Right Orbit X-RED	9	a	-	LED1	-	-	-	Playfield	Feature	RGB	9-LP-8	520-7078-00
198	Right Orbit X-GRN	9	a	-	LED1	-	-	-	Playfield	Feature	RGB	9-LP-9	520-7078-00
199	Right Orbit X-BLU	9	a	-	LED1	-	-	-	Playfield	Feature	RGB	9-LP-10	520-7078-00
200	Right Orbit Rectangle-RED	9	a	-	LED8	-	-	-	Playfield	Feature	RGB	9-LP-21	520-7078-00
201	Right Orbit Rectangle-GRN	9	a	-	LED8	-	-	-	Playfield	Feature	RGB	9-LP-22	520-7078-00
202	Right Orbit Rectangle-BLU	9	a	-	LED8	-	-	-	Playfield	Feature	RGB	9-LP-23	520-7078-00
203													
204	Right Scoop Arrow-RED	10	a	-	LED15	-	-	-	Playfield	Feature	RGB	10-LP-18	520-7079-00

Continued on next page...

LIGHT REFERENCE CONTINUED

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
205	Right Scoop Arrow-GRN	10	a	-	LED15	-	-	-	Playfield	Feature	RGB	10-LP-19	520-7079-00
206	Right Scoop Arrow-BLU	10	a	-	LED15	-	-	-	Playfield	Feature	RGB	10-LP-20	520-7079-00
207	Right Scoop X-RED	10	a	-	LED14	-	-	-	Playfield	Feature	RGB	10-LP-15	520-7079-00
208	Right Scoop X-GRN	10	a	-	LED14	-	-	-	Playfield	Feature	RGB	10-LP-16	520-7079-00
209	Right Scoop X-BLU	10	a	-	LED14	-	-	-	Playfield	Feature	RGB	10-LP-17	520-7079-00
210	Right Scoop Rectangle-RED	10	a	-	LED1	-	-	-	Playfield	Feature	RGB	10-LP-0	520-7079-00
211	Right Scoop Rectangle-GRN	10	a	-	LED1	-	-	-	Playfield	Feature	RGB	10-LP-1	520-7079-00
212	Right Scoop Rectangle-BLU	10	a	-	LED1	-	-	-	Playfield	Feature	RGB	10-LP-2	520-7079-00
213													
214													
215	Billboard 1	9	a	CN2	5	BRN BLK	1	RED	Playfield	Feature	White	9-LP-11	520-5307-00
216	Billboard 2	9	a	CN2	4	BRN	1	RED	Playfield	Feature	White	9-LP-12	520-5307-00
217	Billboard 3	9	a	CN2	3	BRN RED	1	RED	Playfield	Feature	White	9-LP-13	520-5307-00
218	Billboard 4	9	a	CN2	2	BRN ORG	1	RED	Playfield	Feature	White	9-LP-14	520-5307-00
219													
220	Hadron Enforcer 1-RED	8	b	-	LED16	-	-	-	Playfield	Feature	RGB	8-LP-29	520-7081-00
221	Hadron Enforcer 1-GRN	8	b	-	LED16	-	-	-	Playfield	Feature	RGB	8-LP-30	520-7081-00
222	Hadron Enforcer 1-BLU	8	b	-	LED16	-	-	-	Playfield	Feature	RGB	8-LP-31	520-7081-00
223	Hadron Enforcer 2-RED	8	c	-	LED4	-	-	-	Playfield	Feature	RGB	8-LP-37	520-7077-00
224	Hadron Enforcer 2-GRN	8	c	-	LED4	-	-	-	Playfield	Feature	RGB	8-LP-38	520-7077-00
225	Hadron Enforcer 2-BLU	8	c	-	LED4	-	-	-	Playfield	Feature	RGB	8-LP-39	520-7077-00
226	Hadron Enforcer 3-RED	8	c	-	LED9	-	-	-	Playfield	Feature	RGB	8-LP-52	520-7077-00
227	Hadron Enforcer 3-GRN	8	c	-	LED9	-	-	-	Playfield	Feature	RGB	8-LP-53	520-7077-00
228	Hadron Enforcer 3-BLU	8	c	-	LED9	-	-	-	Playfield	Feature	RGB	8-LP-54	520-7077-00
229	Hadron Enforcer 4-RED	9	a	-	LED7	-	-	-	Playfield	Feature	RGB	9-LP-18	520-7078-00
230	Hadron Enforcer 4-GRN	9	a	-	LED7	-	-	-	Playfield	Feature	RGB	9-LP-19	520-7078-00
231	Hadron Enforcer 4-BLU	9	a	-	LED7	-	-	-	Playfield	Feature	RGB	9-LP-20	520-7078-00
232	Hadron Enforcer 5-RED	10	a	-	LED16	-	-	-	Playfield	Feature	RGB	10-LP-21	520-7079-00
233	Hadron Enforcer 5-GRN	10	a	-	LED16	-	-	-	Playfield	Feature	RGB	10-LP-22	520-7079-00
234	Hadron Enforcer 5-BLU	10	a	-	LED16	-	-	-	Playfield	Feature	RGB	10-LP-23	520-7079-00
235													
236													
237													
238													
239	Left Pop Bumper-RED	11	-	CN16	8	RED BLK	1	YEL	Playfield	Feature	RGB	11-LP-7	520-6971-00
240	Left Pop Bumper-GRN	11	-	CN16	9	GRN BLK	1	YEL	Playfield	Feature	RGB	11-LP-8	520-6971-00
241	Left Pop Bumper-BLU	11	-	CN16	10	BLU BLK	1	YEL	Playfield	Feature	RGB	11-LP-9	520-6971-00
242	Right Pop Bumper-RED	11	-	CN16	11	RED BRN	1	YEL	Playfield	Feature	RGB	11-LP-10	520-6971-00
243	Right Pop Bumper-GRN	11	-	CN16	12	GRN BRN	1	YEL	Playfield	Feature	RGB	11-LP-11	520-6971-00
244	Right Pop Bumper-BLU	11	-	CN16	13	BLU BRN	1	YEL	Playfield	Feature	RGB	11-LP-12	520-6971-00
245	Bottom Pop Bumper-RED	11	-	CN16	14	RED ORG	1	YEL	Playfield	Feature	RGB	11-LP-13	520-6971-00
246	Bottom Pop Bumper-GRN	11	-	CN16	15	GRN RED	1	YEL	Playfield	Feature	RGB	11-LP-14	520-6971-00
247	Bottom Pop Bumper-BLU	11	-	CN16	16	BLU RED	1	YEL	Playfield	Feature	RGB	11-LP-15	520-6971-00
248													
249	Top Lane-Left-RED	11	-	CN16	2	RED VIO	1	YEL	Playfield	Feature	RGB	11-LP-1	520-5333-00
250	Top Lane-Left-GRN	11	-	CN16	3	GRN VIO	1	YEL	Playfield	Feature	RGB	11-LP-2	520-5333-00
251	Top Lane-Left-BLU	11	-	CN16	4	BLU VIO	1	YEL	Playfield	Feature	RGB	11-LP-3	520-5333-00
252	Top Lane-Right-RED	11	-	CN16	5	RED GRY	1	YEL	Playfield	Feature	RGB	11-LP-4	520-5333-00
253	Top Lane-Right-GRN	11	-	CN16	6	GRN GRY	1	YEL	Playfield	Feature	RGB	11-LP-5	520-5333-00
254	Top Lane-Right-BLU	11	-	CN16	7	BLU GRY	1	YEL	Playfield	Feature	RGB	11-LP-6	520-5333-00
255													

Continued on next page...

LIGHT REFERENCE CONTINUED

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
256	Orb-RED	9	a	CN4	4	RED VIO	1	RED	Playfield	Feature	RGB	9-LP-45	520-5333-00
257	Orb-GRN	9	a	CN4	3	GRN VIO	1	RED	Playfield	Feature	RGB	9-LP-46	520-5333-00
258	Orb-BLU	9	a	CN4	2	BLU VIO	1	RED	Playfield	Feature	RGB	9-LP-47	520-5333-00
259													
260													
261													
262													
263													
264													
265													
266													
267													
268													
269													
270													
271													
272													
273													
274													
275	Coin Door GI	1	-	CN5	2	YEL	1	YEL-WHT	Coin Door	G.I.	White	1-LP-1	112-5033-08
276	Bottom RED GI	8	-	CN15	5	RED BLK	1	YEL RED	Playfield	G.I.	RED	8-LP-0	112-5034-02
277	Bottom WHITE GI	8	-	CN15	6	WHT BLK	2	YEL BLK	Playfield	G.I.	WHITE	8-LP-1	112-5034-08 520-5307-00(Bot.Arch)
278	Bottom BLUE GI	8	-	CN15	7	BLU BLK	3	YEL BLU	Playfield	G.I.	BLUE	8-LP-2	112-5034-05
279	Top RED GI	9	-	CN15	5	RED BLK	1	YEL RED	Playfield	G.I.	RED	9-LP-0	112-5034-02
280	Top WHITE GI	9	-	CN15	6	WHT BLK	2	YEL BLK	Playfield	G.I.	WHITE	9-LP-1	112-5034-08
281	Top BLUE GI	9	-	CN15	7	BLU BLK	3	YEL BLU	Playfield	G.I.	BLUE	9-LP-2	112-5034-05
282	Backpanel GI	11	-	CN13	1	RED BLK	3	YEL RED	Playfield	G.I.	WHITE	11-LP-0	112-5034-08
283													
284													
285	Left Sling	10	b	CN5	3	ORG	1	RED	Playfield	Flash	White	10-LP-30	520-7000-00
286	Right Sling	10	b	CN4	3	ORG	1	RED	Playfield	Flash	White	10-LP-29	520-7000-00
287	Yondu	8	-	CN14	4	BRN RED	7/8	YEL	Playfield	Flash	White	8-LP-5	113-5045-08
288	Left Ramp Top	9	-	CN14	6	BRN GRN	7/8	YEL	Playfield	Flash	White	9-LP-3	520-7000-00
289	Left Ramp Bottom	8	-	CN14	6	BRN BLK	7/8	YEL	Playfield	Flash	White	8-LP-3	520-7000-00
290	Right Ramp Top	9	-	CN14	5	BRN BLU	7/8	YEL	Playfield	Flash	White	9-LP-4	520-7000-00
291	Right Ramp Bottom	8	-	CN14	5	BRN	7/8	YEL	Playfield	Flash	White	8-LP-4	520-7000-00
292	Pop Bumper	9	-	CN14	4	BRN VIO	7/8	YEL	Playfield	Flash	White	9-LP-5	113-5045-08
293	Magnet	8	b	CN2	4	ORG RED	1/2	RED	Playfield	Flash	White	8-LP-14	113-5045-08
294	Drop Target	9	-	CN14	3	BRN GRY	6/7	YEL	Playfield	Flash	White	9-LP-6	113-5045-08
295	Rocket Spot Light	8	c	CN1	3	ORG	1	RED	Playfield	Flash	White	8-LP-33	113-5032-08
296	Groot Spot Light	11	a	CN1	3	ORG	1	RED	Playfield	Flash	White	11-LP-16	113-5032-08
297													
298													
299													
300													

3.5 MOTOR REFERENCE

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
1	Motor A Enable-Orb	9	b	CN1	-	-	-	-	Playfield	Motor	-	9-LP-48	520-6996-00
2	Motor A Control 1A-Orb	9	b	CN1	-	-	-	-	Playfield	Motor	-	9-LP-49	520-6996-00
3	Motor A Control 2A-Orb	9	b	CN1	-	-	-	-	Playfield	Motor	-	9-LP-50	520-6996-00
4													
5	Motor B Enable-Groot Jaw	9	b	CN1	-	-	-	-	Playfield	Motor	-	9-LP-51	520-6996-00
6	Motor B Control 1A-Groot Jaw	9	b	CN1	-	-	-	-	Playfield	Motor	-	9-LP-52	520-6996-00
7	Motor B Control 2A-Groot Jaw	9	b	CN1	-	-	-	-	Playfield	Motor	-	9-LP-53	520-6996-00
8													
9													
10													

MOTOR A		Coast	Brake	Brake	Dir. 1	Dir. 2
x-LP-0	Enable A	H	L	L	L	L
x-LP-1	Control 1A	H	L	H	L	H
x-LP-2	Control 2A	H	L	H	H	L
			L/Low=Lamp On			
			H/High=Lamp Off			
MOTOR B		**Coast**	**Brake**	**Brake**	**Dir. 1**	**Dir. 2**
x-LP-3	Enable B	H	L	L	L	L
x-LP-4	Control 1B	H	L	H	L	H
x-LP-5	Control 2B	H	L	H	H	L
x=Node #			L/Low=Lamp On			
			H/High=Lamp Off			

4. ELECTRONIC PINOUTS AND SCHEMATICS

4.1 SPIKE-2 CPU NODE 0

509-1003-01

DIRECT SWITCH MAPPING (CN25)

The coin-door diagnostic switches are connected directly to the CPU node via the Cabinet Node. Note that both the CPU and Cabinet nodes are required for diagnostic switch operation.

ID	Name	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
C1	DIP 1	-	-	-	-	-	CPU Node		0-SW-0	-
C2	DIP 2	-	-	-	-	-	CPU Node		0-SW-1	-
C3	DIP 3	-	-	-	-	-	CPU Node		0-SW-2	-
C4	DIP 4	-	-	-	-	-	CPU Node		0-SW-3	-
C5	DIP 5	-	-	-	-	-	CPU Node		0-SW-4	-
C6	DIP 6	-	-	-	-	-	CPU Node		0-SW-5	-
C7	DIP 7	-	-	-	-	-	CPU Node		0-SW-6	-
C8	DIP 8	-	-	-	-	-	CPU Node		0-SW-7	-
C9	Service Select	CN25	1	LGN-GRY	11	BLK-WHT	Coin Door		0-SW-9	180-5192-04
C10	Service Plus	CN25	2	LGN-VIO	11	BLK-WHT	Coin Door		0-SW-10	180-5192-02
C11	Service Minus	CN25	3	LGN-BLU	11	BLK-WHT	Coin Door		0-SW-11	180-5192-02
C12	Service Back	CN25	4	LGN-BLK	11	BLK-WHT	Coin Door		0-SW-12	180-5192-00

CONNECTORS

ID	Connector Type	Description
CN1	5-Pin .156” Header	Backbox 2-channel amplified speaker out
CN2	3-Pin .100” Header	Console Port
CN3	7-Pin .100” Header	Headphone connector
CN4	2-Pin .156”	Cabinet 1-channel amplified speaker out
CN5	6-Pin .100” Header	Line In/Out
CN6	34 Pin 2.00mm Header	LCD display connector
CN7	5-Pin .156” Header	48V supply from main power supply
CN8	6-Pin .100” Header	SPI Serial
CN9	USB	USB connector - for software updates, audit dumps, and expansion modules
CN9	USB	USB connector - for software updates, audit dumps, and expansion modules
CN10	HDMI	HDMI Out
CN11	RJ45	SPIKE node bus - to cabinet node N1
CN12	RJ45	SPIKE node bus - To Topper accessory Kit
CN13	SD CARD	SD Card connector
CN14	5-Pin .100” Header	LCD Backlight
CN15	3-Pin .100” Header	Backbox Light
CN16	4-Pin .100” Header	3.3v / 5v / 12v
CN17	ETHERNET	ETHERNET connector
CN21	SATA Header	SATA connector
CN22	RJ45	SPIKE node bus - to playfield node
CN25	12-Pin .100” Header	Dedicated switch inputs - service, volume switches

COMPONENTS

ID	Name
S1	DIP Switches
S2	Reset Switch
SD CARD (CN13)	For system SD card. Note: only to be removed if instructed to by Stern Service.
BT1	BR1225 3V Lithium battery for game clock between power cycles

STATUS LEDS

LED ID	Name	Color	Description
48V	+48V Supply In	Red	ON: Main system power is connected, OFF: No 48V system power. Check power supply connections, cables, and fuses.
24V	+24V Audio Power	Red	ON: Audio power supply is good, OFF: Audio power supply off, call tech support.
9V	+9V Node Bus Power	Red	ON: Node bus power supply is good, OFF: Node bus power supply bad, call tech support.
5V		Red	ON: Logic power supply is good. OFF: Logic power supply bad, call tech support.
TxD	Node bus transmit	Red	Node bus transmit activity
RxD	Node bus receive	Red	Node bus receive activity
Status	System status	Red	Constant double blink - game software running
Netstat	Network status	Red	Communication bridge activity

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SPIKE-2 CPU NODE 0 CONTINUED

AUDIO PINOUTS

ID	Type	Pin	Description	Minimum Impedance	Max Power (RMS)
CN1	.156" 5-pin Header	1	Speaker Right Ground (-)	4 Ohms	-
		2	Speaker Right (+)	4 Ohms	20W
		3	n/c	-	-
		4	Speaker Left Ground (-)	4 Ohms	-
		5	Speaker Left (+)	4 Ohms	20W
CN3	.100" 7-pin Header	1	n/c	-	-
		2	L-HP	16 Ohms	15 mW
		3	R-HP	16 Ohms	15 mW
		4	n/c	-	-
		5	Headphone Detect	-	-
		6	Headphone vol +	-	-
		7	Headphone vol -	-	-
CN4	.156" 2-pin Header	1	Woofer Ground (-)	8 Ohms	-
		2	Woofer Out (+)	8 Ohms	40W
CN5	.100" 6-pin Header	1	n/c	-	-
		2	L-IN	30K Ohms	0.6VRMS
		3	R-IN	30K Ohms	0.6VRMS
		4	n/c	-	-
		5	L-OUT	10K Ohms	1.5V
		6	R-OUT	10K Ohms	1.5V

COUNTRY CODES (DIP S2)

	DIP S2							
Country	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
USA	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Austria	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Australia	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
Belgium	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Canada 1	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
Canada 2	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
China	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
Croatia	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
Denmark	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
Finland	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
France	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
Germany	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
Greece	ON	ON	ON	ON	OFF	OFF	OFF	OFF
Italy	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
Japan	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
Middle East	ON	ON	ON	OFF	ON	OFF	OFF	OFF
Netherlands	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
New Zealand	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Norway	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
Portugal	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
Russia	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
S. Africa	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
Spain	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
Sweden	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
Switzerland	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
Taiwan	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
United Kingdom	OFF	ON	ON	ON	OFF	OFF	OFF	OFF

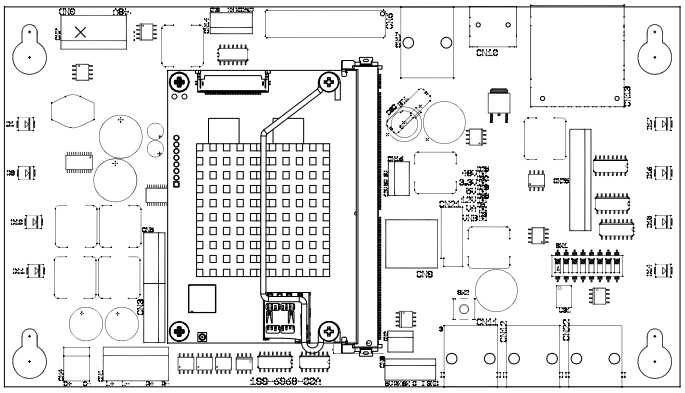


Figure 4.1.1. SPIKE 2 CPU Node connector detail.

COIN DOOR SERVICE SWITCH WIRING

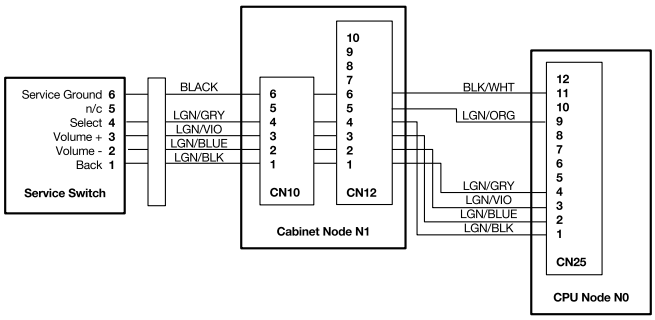
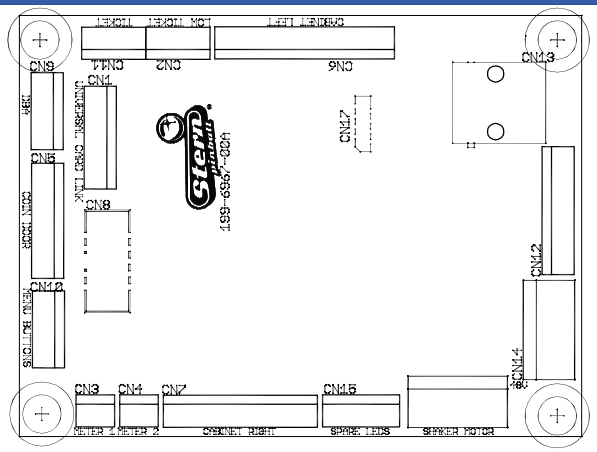


Figure 4.1.2. Service switch wiring. Note that the Cabinet Node must be present and CN10 and CN12 connected for the Coin Door Service Switches to function correctly.

4.2 CABINET NODE 1

520-6967-72

ID	Type	Pin	Description	Wire Color
CN1	.100" 8-Pin Header Universal Card Link	1	12V	-
		2	Coin 1	-
		3	Meter 1	-
		4	N/C	-
		5	Notch	-
		6	Coin Enable	-
		7	Ticket Enable	-
		8	Ground	-
CN2	.100" 5-Pin Header low ticket	1	Ground	-
		2	Ticket Low sw.	-
		3	Key	-
		4	Ticket Low	-
		5	5V Out	-
CN3	.100" 3-Pin Header Meter 1	1	Meter 12V (+)	RED
		2	Meter (-)	BLK
		3	N/C	-
CN4	.100" 3-Pin Header Meter 2	1	Meter 12V (+)	RED
		2	Meter (-)	BLK
		3	N/C	-
CN5	.100" 9-Pin Header	1	5V Out	YEL/WHT
		2	Coin LED Out	YEL
		3	Ground	BLK
		4	Slam Tilt In	LGN/RED
		5	Coin 5	PNK/GRN*
		6	Coin 4	PNK/YEL*
		7	Coin 3	PNK/ORN*
		8	Coin 2	PNK/RED*
		9	Coin 1	PNK/BRN*
CN6	.100" 14-Pin Header Cabinet Left	1	5V LED Power	RED
		2	Start 2 LED	YEL-RED
		3	Start 1 LED	YEL-BRN
		4	Spare LED	-
		5	Ground	BLK-WHT
		6	Spare Left	-
		7	Tilt Input	WHT
		8	Door Open	-
		9	Start 2 Switch	GRY-WHT
		10	Start 1 Switch	GRY
		11	N/C	-
		12	N/C	-
		13	N/C	-
		14	N/C	-
CN7	.100" 12-Pin Header Cabinet Right	1	5V LED Power	RED
		2	Plunge 2 LED	RED-WHT
		3	Plunge 1 LED	GRN-WHT
		4	Spare LED 2	BLU-WHT
		5	Ground	BLK-WHT
		6	Spare Right In	-
		7	Plunge 2 Switch	-
		8	Plunge 1 Switch	TAN-WHT
		9	N/C	-
		10	N/C	-
		11	N/C	-
		12	N/C	-
CN9	.100" 6-Pin Header Dollar Bill Acceptor	1	Coin Enable/DBA Inhibit (-)	-
		2	Coin Enable/DBA Inhibit (+)	-
		3	Key	Key
		4	DBA 12V	-
		5	Coin 6 / DBA Credit	-
		6	Ground	-



CN10	.100" 6-Pin Header Service Switch In	1	Service Back (To Coindoor)	LGN-BLK
		2	Service Down (To Coindoor)	LGN-BLU
		3	Service Up (To Coindoor)	LGN-VIO
		4	Service Select (To Coindoor)	LGN-GRY
		5	Key	Key
		6	Service Ground (To Coindoor)	BLK
CN11	.100" 5-Pin Header Ticket Dispenser	1	12V	RED
		2	N/C	-
		3	Ticket Dispenser Enable	WHT
		4	Ground	BLK
		5	Ticket Dispenser Notch	BLU
CN12	.100" 10-Pin Header CPU Direct Switches	1	Service Back (To CPU)	LGN-BLK
		2	Service Down (To CPU)	LGN-BLU
		3	Service Up (To CPU)	LGN-VIO
		4	Service Select (To CPU)	LGN-GRY
		5	Power Present	LGN-ORG
		6	Service Ground (To CPU)	BLK-WHT
		7	N/C	-
		8	N/C	-
		9	N/C	-
		10	N/C	-
CN14	.156" 5-Pin Header Power Input	1	Ground	BLK
		2	Key	Key
		3	N/C	-
		4	N/C	-
		5	48VDC In	GRY-YEL
CN15	.100" 6-Pin Header Spare LED's	1	5V LED Power	-
		2	Key	Key
		3	Spare LED 3	-
		4	Spare LED 4	-
		5	Spare LED 5	-
		6	Spare LED 6	-
CN16	.156" 5-Pin Header Shaker Motor	1	Shaker Motor (-)	BLU
		2	Shaker Motor (-)	-
		3	Shaker Motor (+)	-
		4	Key	Key
		5	Shaker Motor (+)	RED
			*Varies by country model	

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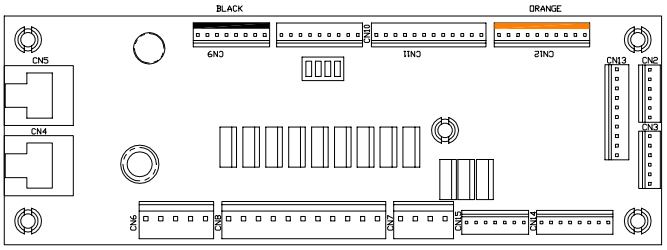
4.3 LOWER PLAYFIELD 48V DRIVER PINOUT NODE 8

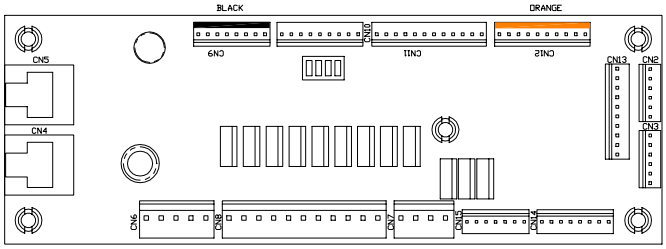
520-7017-72



ID	Type	Pin	Description	Wire Color
SW1	Address DIP	-	Node 8 - OFF-OFF-OFF-OFF	-
CN4	RJ45	-	SPIKE Node Bus	Multi
CN5	RJ45	-	SPIKE Node Bus	Multi
CN6	.156" 5-Pin Header Node Power	1	Ground	BLK
		2	Key	Key
		3	N/C	-
		4	N/C	-
		5	48VDC In	GRY
CN7	.156" 4-Pin Header (White)	1	48V Driver Power	GRY-ORG
		2	8-DR-8 Driver Return	YEL-BRN
		3	8-DR-6 Driver Return	YEL-BLK
		4	8-DR-7 Driver Return	YEL-RED
CN8	.156 11-Pin Header (White)	1	48V Driver Power	GRY-ORG
		2	48V Driver Power	GRY-ORG
		3	48V Driver Power	GRY-ORG
		4	48V Driver Power	GRY-ORG
		5	8-DR-0 Driver Return	ORG-GRN
		6	8-DR-5 Driver Return	ORG-YEL
		7	8-DR-1 Driver Return	ORG-GRY
		8	8-DR-8 Driver Return	-
		9	8-DR-4 Driver Return	ORG-WHT
		10	8-DR-2 Driver Return	ORG-VIO
		11	8-DR-3 Driver Return	ORG-BLU
CN9	.100" 8-Pin Header	1	V+	-
		2	V+	-
		3	8-SW-24 Switch	GRY-RED
		4	8-SW-25 Switch	GRY-BRN
		5	8-SW-26 Switch	-
		6	8-SW-27 Switch	-
		7	Ground	BLK-GRN
		8	Ground	-
CN10	.100" 9-Pin Header	1	V+	-
		2	8-SW-28 Switch	GRY-WHT
		3	8-SW-29 Switch	GRY-VIO
		4	8-SW-30 Switch	GRY-BLU
		5	8-SW-31 Switch	GRY-GRN
		6	8-SW-16 Switch	GRY-YEL
		7	Ground	BLK-GRN
		8	Ground	BLK-GRN
		9	Ground	BLK-GRN
CN11	.100" 12-Pin Header	1	V+	-
		2	8-SW-26 Switch	-
		3	8-SW-27 Switch	-
		4	8-SW-17 Switch	LGN-RED
		5	8-SW-18 Switch	LGN-ORG
		6	8-SW-19 Switch	LGN-YEL
		7	8-SW-20 Switch	LGN-BLU
		8	8-SW-21 Switch	LGN-VIO
		9	8-SW-22 Switch	-
		10	8-SW-23 Switch	-
		11	Ground	BLK-ORG
		12	Ground	BLK-ORG
CN12	.100" 10-Pin Header(Orange)	1	V+	RED
		2	8-SW-8 Switch	WHT-BRN
		3	8-SW-9 Switch	WHT-RED
		4	8-SW-10 Switch	-
		5	8-SW-11 Switch	-
		6	8-SW-12 Switch	WHT-GRN
		7	8-SW-13 Switch	WHT-BLU
		8	8-SW-14 Switch	WHT-VIO
		9	8-SW-15 Switch	WHT-GRY
		10	Ground	BLK-RED
CN13	.100" 10-Pin Header	1	V+	-
		2	8-SW-0 Switch	-
		3	8-SW-1 Switch	-
		4	8-SW-2 Switch	-
		5	8-SW-3 Switch	-
		6	8-SW-4 Switch	-
		7	8-SW-5 Switch	-
		8	8-SW-6 Switch	-
		9	8-SW-7 Switch	-
		10	Ground	-
CN14	.100" 8-Pin Header	1	Ground	-
		2	8-LP-7 Driver Return	-
		3	8-LP-6 Driver Return	-
		4	8-LP-5 Driver Return	BRN-RED
		5	8-LP-4 Driver Return	BRN
		6	8-LP-3 Driver Return	BRN-BLK
		7	LED V+	YEL
		8	LED V+	YEL
CN15	.100" 7-Pin Header	1	LED V+	YEL-RED
		2	LED V+	YEL-BLK
		3	LED V+	YEL-BLU
		4	-	-
		5	8-LP-0 GI Return	RED-BLK
		6	8-LP-1 GI Return	WHT-BLK
		7	8-LP-2 GI Return	BLU-BLK
CN2	.100" 6-Pin Header, Node Extension Bus	1	Ground	BLK
		2	DIN	VIO-BLK
		3	DOUT	VIO-BRN
		4	SCK	VIO-RED
		5	RCK	VIO-ORG
		6	V+	RED
CN3	.100" 6-Pin Header, Node Extension Bus	1	Ground	BLK
		2	DIN	VIO-BLK
		3	DOUT	VIO-BRN
		4	SCK	VIO-RED
		5	RCK	VIO-ORG
		6	V+	RED

4.4 MID UPPER PLAYFIELD 48V DRIVER PINOUT NODE 9

520-7017-72



ID	Type	Pin	Description	Wire Color
SW1	Address DIP	-	Node 9 - OFF-OFF-ON-OFF	-
CN4	RJ45	-	SPIKE Node Bus	Multi
CN5	RJ45	-	SPIKE Node Bus	Multi
CN6	.156" 5-Pin Header Node Power	1	Ground	BLK
		2	Key	Key
		3	N/C	-
		4	N/C	-
		5	48VDC In	GRY
CN7	.156" 4-Pin Header (White)	1	48V Driver Power	GRY-BRN
		2	9-DR-8 Driver Return	YEL-VIO
		3	9-DR-6 Driver Return	BRN-BLK
		4	9-DR-7 Driver Return	YEL-GRY
CN8	.156 11-Pin Header (White)	1	48V Driver Power	GRY-BRN
		2	48V Driver Power	GRY-BRN
		3	48V Driver Power	GRY-BRN
		4	48V Driver Power	GRY-BRN
		5	9-DR-0 Driver Return	BLU YEL
		6	9-DR-5 Driver Return	BRN-RED
		7	9-DR-1 Driver Return	YEL-ORG
		8	9-DR-8 Driver Return	-
		9	9-DR-4 Driver Return	ORG-RED
		10	9-DR-2 Driver Return	ORG-BLK
		11	9-DR-3 Driver Return	ORG-BRN
CN9	.100" 8-Pin Header	1	V+	-
		2	V+	-
		3	9-SW-24 Switch	-
		4	9-SW-25 Switch	-
		5	9-SW-26 Switch	-
		6	9-SW-27 Switch	-
		7	Ground	-
		8	Ground	-
CN10	.100" 9-Pin Header	1	V+	-
		2	9-SW-28 Switch	GRY-BLK
		3	9-SW-29 Switch	GRY-BRN
		4	9-SW-30 Switch	GRY-RED
		5	9-SW-31 Switch	GRY-ORG
		6	9-SW-16 Switch	GRY-YEL
		7	Ground	BLK-YEL
		8	Ground	BLK-YEL
		9	Ground	BLK-YEL
CN11	.100" 12-Pin Header	1	V+	RED
		2	9-SW-26 Switch	TAN-BLK
		3	9-SW-27 Switch	TAN-RED
		4	9-SW-17 Switch	TAN-ORG
		5	9-SW-18 Switch	TAN-YEL
		6	9-SW-19 Switch	TAN-GRN
		7	9-SW-20 Switch	TAN-BLU
		8	9-SW-21 Switch	TAN-VIO
		9	9-SW-22 Switch	TAN
		10	9-SW-23 Switch	TAN-WHT
		11	Ground	BLK-BLU
		12	Ground	BLK-BLU
CN12	.100" 10-Pin Header(Orange)	1	V+	RED
		2	9-SW-8 Switch	WHT-BRN
		3	9-SW-9 Switch	WHT-RED
		4	9-SW-10 Switch	WHT-ORG
		5	9-SW-11 Switch	WHT-YEL
		6	9-SW-12 Switch	WHT-GRN
		7	9-SW-13 Switch	WHT-BLU
		8	9-SW-14 Switch	WHT-VIO
		9	9-SW-15 Switch	WHT-GRY
		10	Ground	BLK-VIO
CN13	.100" 10-Pin Header	1	V+	RED
		2	9-SW-0 Switch	PNK-BLK
		3	9-SW-1 Switch	PNK-BRN
		4	9-SW-2 Switch	PNK-RED
		5	9-SW-3 Switch	PNK-ORG
		6	9-SW-4 Switch	PNK-YEL
		7	9-SW-5 Switch	PNK-GRN
		8	9-SW-6 Switch	PNK-BLU
		9	9-SW-7 Switch	-
		10	Ground	BLK-GRY
CN14	.100" 8-Pin Header	1	Ground	-
		2	9-LP-7 Driver Return	-
		3	9-LP-6 Driver Return	BRN-GRY
		4	9-LP-5 Driver Return	BRN-VIO
		5	9-LP-4 Driver Return	BRN-BLU
		6	9-LP-3 Driver Return	BRN-GRN
		7	LED V+	YEL
		8	LED V+	YEL
CN15	.100" 7-Pin Header	1	LED V+	YEL-RED
		2	LED V+	YEL-BLK
		3	LED V+	YEL-BLU
		4	-	-
		5	9-LP-0 GI Return	RED-BLK
		6	9-LP-1 GI Return	WHT-BLK
		7	9-LP-2 GI Return	BLU-BLK
CN2	.100" 6-Pin Header, Node Extension Bus	1	Ground	BLK
		2	DIN	VIO-BLK
		3	DOUT	VIO-BRN
		4	SCK	VIO-RED
		5	RCK	VIO-ORG
		6	V+	RED
CN3	.100" 6-Pin Header, Node Extension Bus	1	Ground	-
		2	DIN	-
		3	DOUT	-
		4	SCK	-
		5	RCK	-
		6	V+	-

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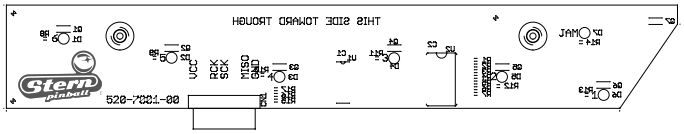
4.5 THROUGH SERIAL OPTO RECEIVER EXTENSION 8A

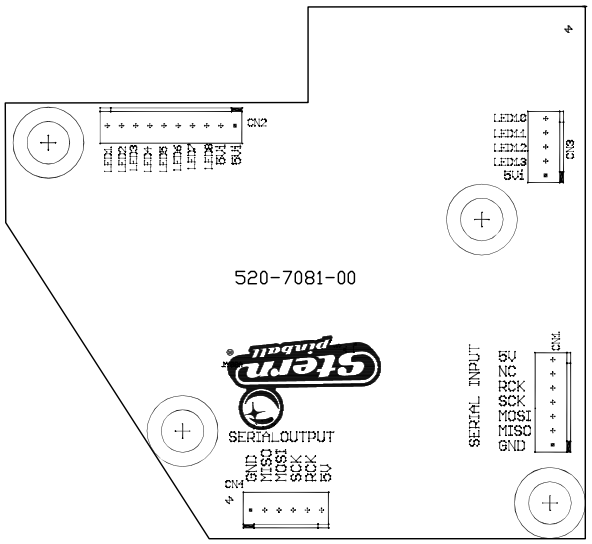
520-7001-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	-
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	N/C	-
		7	+5 VDC IN	RED

4.6 LEFT LOWER LED BOARD 8B

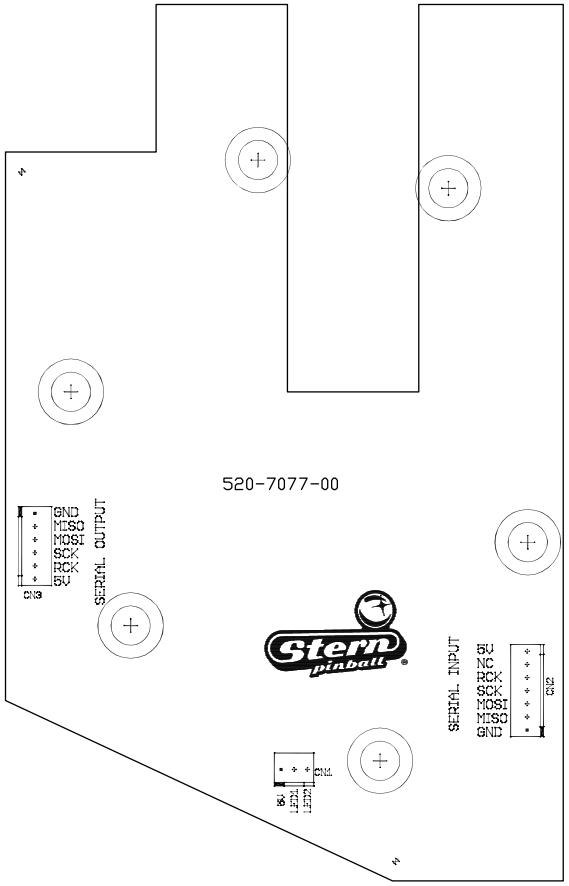
520-7081-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN2	.100" 10-Pin Header	1	+5 VDC	RED
		2	+5 VDC	RED
		3	LP-8 Light Return	-
		4	LP-7 Light Return	ORG-RED
		5	LP-6 Light Return	BLU-GRY
		6	LP-5 Light Return	GRN-GRY
		7	LP-4 Light Return	RED-GRY
		8	LP-3 Light Return	BLU-VIO
		9	LP-2 Light Return	GRN-VIO
		10	LP-1 Light Return	RED-VIO
CN3	.100" 5-Pin Header	1	+5 VDC	RED
		2	LP-13 Light Return	-
		3	LP-12 Light Return	BLU-YEL
		4	LP-11 Light Return	GRN-YEL
		5	LP-10 Light Return	RED-YEL
CN4	.100" 6-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	V+	RED

4.7 LEFT UPPER LED BOARD 8C

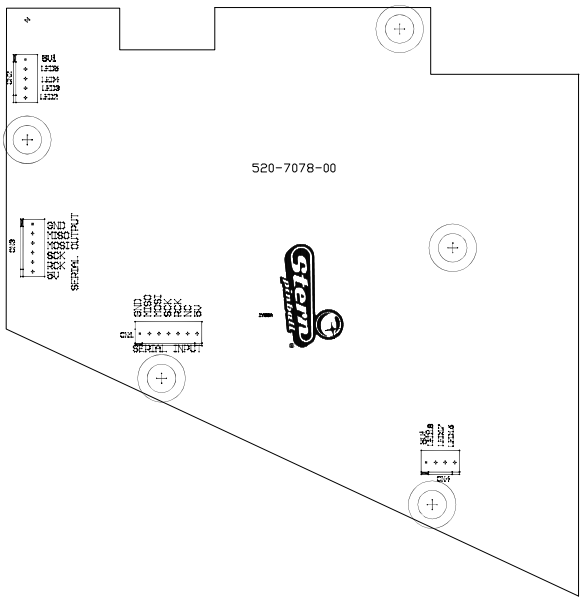
520-7077-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 3-Pin Header	1	+5 VDC	RED
		2	LP-1 Light Return	-
		3	LP-2 Light Return	ORG
CN2	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN3	.100" 6-Pin Header	1	Ground	-
		2	MISO Output Data	-
		3	MOSI Input Data	-
		4	SCK Serial Clock	-
		5	RCK Register Clock	-
		6	V+	-

4.8 RIGHT UPPER LED BOARD 9A

520-7078-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN2	.100" 5-Pin Header	1	+5 VDC	RED
		2	LP-5 Light Return	BRN-ORG
		3	LP-4 Light Return	BRN-RED
		4	LP-3 Light Return	BRN
		5	LP-2 Light Return	BRN-BLK
CN3	.100" 6-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	V+	RED
CN4	.100" 4-Pin Header	1	+5 VDC	RED
		2	LP-18 Light Return	BLU-VIO
		3	LP-17 Light Return	GRN-VIO
		4	LP-16 Light Return	RED-VIO

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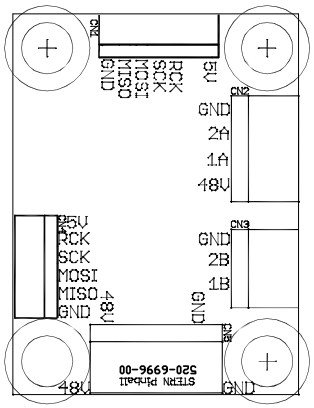
4.9 SERIAL MOTOR DRIVER BOARD 9B

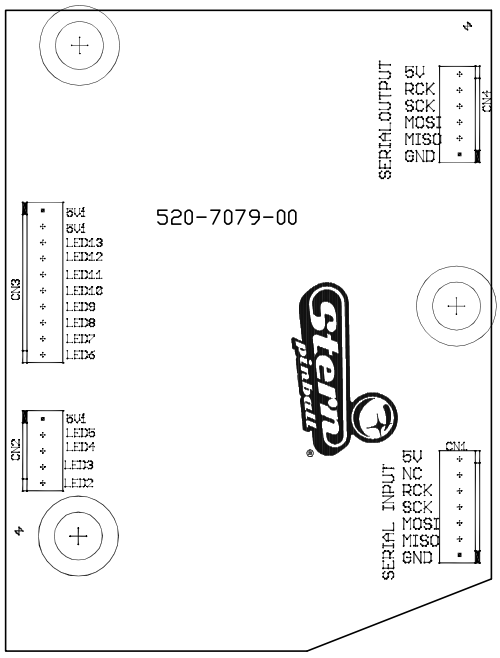
520-6996-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN2	.156 4-Pin Connector	1	Ground	-
		2	DRIVE2-A	GRY
		3	DRIVE1-A	BRN
		4	V+	-
CN3	.156 3-Pin Connector	1	Ground	-
		2	DRIVE2-B	GRY
		3	DRIVE1-B	BRN
CN4	.100" 6-Pin Header	1	Ground	-
		2	MISO Output Data	-
		3	MOSI Input Data	-
		4	SCK Serial Clock	-
		5	RCK Register Clock	-
		6	V+	-
CN5	.156 5-Pin Connector	1	GND	BLK
		2	KEY	Key
		3	N/C	-
		4	N/C	-
		5	+48 VDC IN	GRY

4.10 RIGHT LOWER LED BOARD 10A

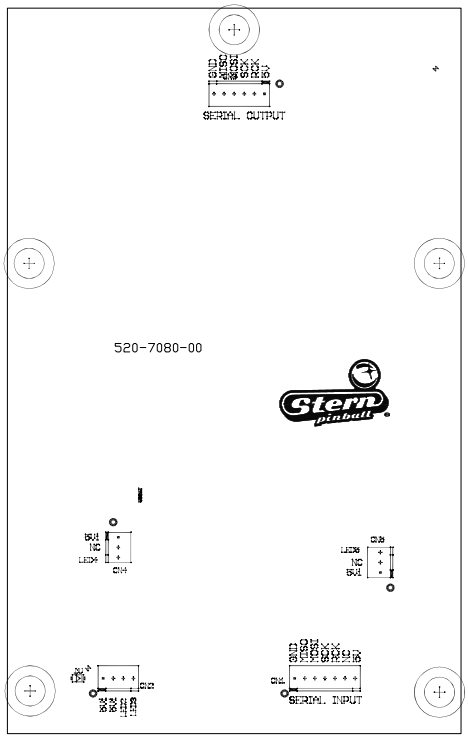
520-7079-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN2	.100" 5-Pin Header	1	+5 VDC	-
		2	LP-5 Light Return	-
		3	LP-4 Light Return	-
		4	LP-3 Light Return	-
		5	LP-2 Light Return	-
CN3	.100" 10-Pin Header	1	+5 VDC	RED
		2	+5 VDC	RED
		3	LP-13 Light Return	-
		4	LP-12 Light Return	-
		5	LP-11 Light Return	BLU-GRY
		6	LP-10 Light Return	GRN-GRY
		7	LP-9 Light Return	RED-GRY
		8	LP-8 Light Return	BLU-VIO
		9	LP-7 Light Return	GRN-VIO
		10	LP-6 Light Return	RED-VIO
CN4	.100" 6-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	V+	RED

4.11 LOWER LED BOARD 10B

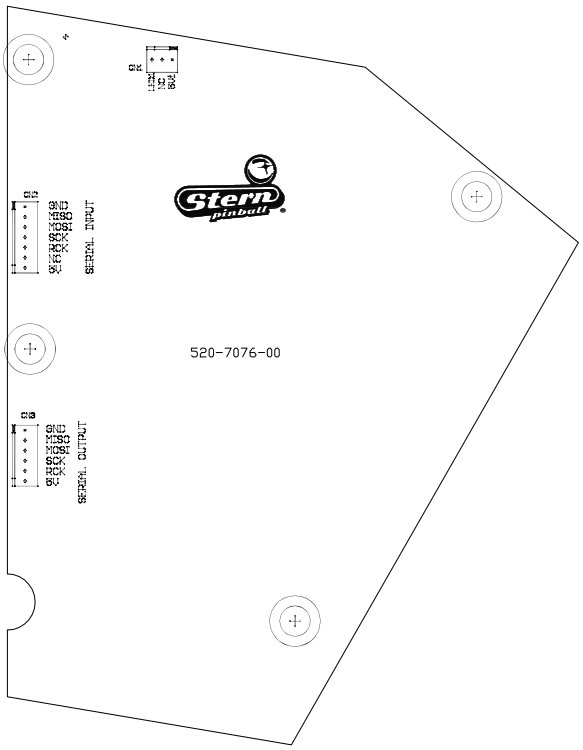
520-7080-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN2	.100" 4-Pin Header	1	+5 VDC	RED
		2	+5 VDC	-
		3	LP-2 Light Return	-
		4	LP-3 Light Return	ORG-YEL
CN3	.100" 6-Pin Header	1	Ground	-
		2	MISO Output Data	-
		3	MOSI Input Data	-
		4	SCK Serial Clock	-
		5	RCK Register Clock	-
		6	V+	-
CN4	.100" 3-Pin Header	1	+5 VDC	RED
		2	n/c	-
		3	LP-4 Light Return	ORG
CN5	.100" 3-Pin Header	1	+5 VDC	RED
		2	n/c	-
		3	LP-5 Light Return	ORG

4.12 CENTER UPPER LED BOARD 11A

520-7076-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 3-Pin Header	1	+5 VDC	RED
		2	n/c	-
		3	LP-1 Light Return	ORG
CN2	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	n/c	-
		7	+5 VDC IN	RED
CN3	.100" 6-Pin Header	1	Ground	-
		2	MISO Output Data	-
		3	MOSI Input Data	-
		4	SCK Serial Clock	-
		5	RCK Register Clock	-
		6	V+	-

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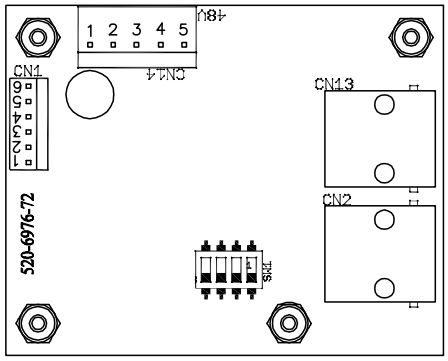
4.13 SPI CORE PLAYFIELD NODE 10

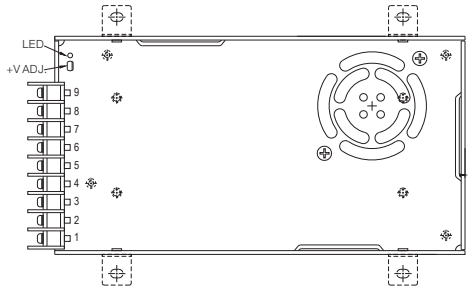
520-6976-72



ID	Type	Pin	Description	Wire Color
SW1	Address DIP	-	Node 10 - OFF-ON-OFF-OFF	-
CN2	RJ45	-	SPIKE Node Bus	Multi
CN13	RJ45	-	SPIKE Node Bus	Multi
CN14	.156" 5-Pin Header Node Power	1	Ground	BLK
		2	Key	Key
		3	N/C	-
		4	N/C	-
		5	48VDC In	GRY
CN1	.100" 6-Pin Header, Node Extension Bus	1	Ground	BLK
		2	DIN	VIO-BLK
		3	DOUT	VIO-BRN
		4	SCK	VIO-RED
		5	RCK	VIO-ORG
		6	V+	RED

4.14 MAIN POWER SUPPLY

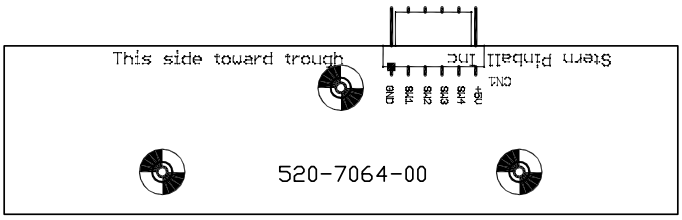
011-5003-00



ID	Type	Pin	Description	Wire Color
CN1	Screw Terminal	1	AC Line Hot In	BLK
		2	AC Line Neutral In	WHT
		3	Earth Ground In	GRN
		4	DC Ground	BLK
		5	DC Ground	BLK
		6	DC Ground	BLK
		7	+48 V System Power	GRY
		8	+48 V System Power	GRY
		9	+48 V System Power	GRY

4.15 TROUGH SERIAL OPTO EMITTER

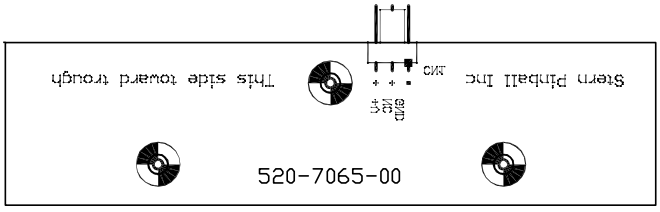
520-7064-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 6-Pin Header	1	Ground	BLK-GRY
		2	MISO Output Data	PNK-BRN
		3	MOSI Input Data	PNK-RED
		4	SCK Serial Clock	PNK-ORG
		5	RCK Register Clock	PNK-YEL
		6	+5 VDC IN	RED

4.16 TROUGH SERIAL OPTO RECEIVER

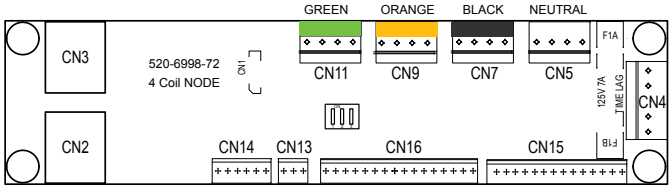
520-7065-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 3-Pin Header	1	Ground	BLK-VIO
		2	N/C	-
		3	+5 VDC IN	RED

4.17 PLAYFIELD 48V 4 COIL PINOUT NODE 11

520-6998-72



ID	Type	Pin	Description	Wire Color
SW1	Address DIP	-	Node 11 - OFF-ON-ON	
CN1	-	-	N/C	-
CN2	RJ45	-	SPIKE Node Bus	Multi
CN3	RJ45	-	SPIKE Node Bus	Multi
CN4	.156" 5-Pin Header Node Power	1	Ground	BLK
		2	Key	KEY
		3	N/C	-
		4	N/C	-
		5	48VDC In	GRY
CN5	.156" 4-Pin Header (White)	1	Switch Ground	-
		2	11-SW-0 Switch Return	-
		3	11-DR-0 Driver Return	BRN-ORG
		4	48V Driver Power	GRY-BLK
CN7	.156" 4-Pin Header (Black)	1	Switch Ground	-
		2	11-SW-1 Switch Return	-
		3	11-DR-1 Driver Return	-
		4	48V Driver Power	-
CN9	.156" 4-Pin Header (Orange)	1	Switch Ground	-
		2	11-SW-2 Switch Return	-
		3	11-DR-2 Driver Return	-
		4	48V Driver Power	-
CN11	.156" 4-Pin Header (Green)	1	Switch Ground	-
		2	11-SW-3 Switch Return	-
		3	11-DR-3 Driver Return	-
		4	48V Driver Power	-
CN13	.100" 3-Pin Header	1	11-LP-0 GI Return (1A Max)	RED-BLK
		2	GI Ground	-
		3	LED V+	YEL-RED
CN14	.100" 6-Pin Header	1	Ground	BLK
		2	DIN	VIO-BLK
		3	DOUT	VIO-BRN
		4	SCK	VIO-RED
		5	RCK	VIO-ORG
		6	V+	RED
CN15	.100" 14-Pin Header	1	+5V	RED
		2	11-SW-4 Switch Return	-
		3	11-SW-5 Switch Return	-
		4	11-SW-6 Switch Return	-
		5	11-SW-7 Switch Return	-
		6	11-SW-8 Switch Return	-
		7	11-SW-9 Switch Return	-
		8	11-SW-10 Switch Return	-
		9	11-SW-11 Switch Return	-
		10	11-SW-12 Switch Return	-
		11	11-SW-13 Switch Return	-
		12	11-SW-14 Switch Return	-
		13	11-SW-15 Switch Return	-
		14	Switch Ground	-
CN16	.100" 16-Pin Header	1	+6V	YEL
		2	11-LP-1 Light Return	RED-VIO
		3	11-LP-2 Light Return	GRN-VIO
		4	11-LP-3 Light Return	BLU-VIO
		5	11-LP-4 Light Return	RED-GRY
		6	11-LP-5 Light Return	GRN-GRY
		7	11-LP-6 Light Return	BLU-GRY
		8	11-LP-7 Light Return	RED-BLK
		9	11-LP-8 Light Return	GRN-BLK
		10	11-LP-9 Light Return	BLU-BLK
		11	11-LP-10 Light Return	RED-BRN
		12	11-LP-11 Light Return	GRN-BRN
		13	11-LP-12 Light Return	BLU-BRN
		14	11-LP-13 Light Return	RED-ORG
		15	11-LP-14 Light Return	GRN-RED
		16	11-LP-15 Light Return	BLU-RED
F1	Fuse		7A SB, 125V	n/a

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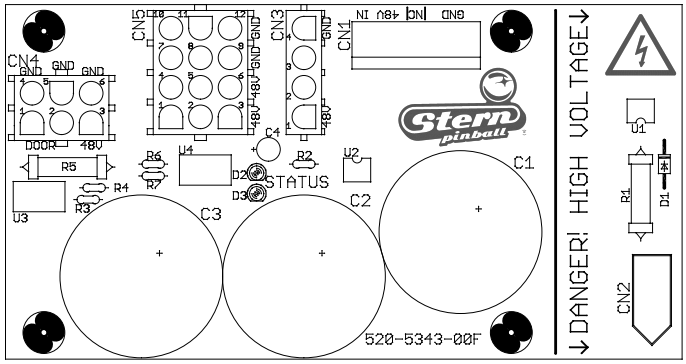
4.18 POWER DISTRIBUTION BOARD

520-5343-01



ID	Type	Pin	Description	Wire Color
CN1	.156 in 7-Pin Housing Plug: 045-5259-07 Pin: 055-5331-00 Key: 060-5013-00	1	+48 VDC IN	GRY
		2	+48 VDC IN	GRY
		3	+48 VDC IN	GRY
		4	Key (n/c)	-
		5	Ground	BLK
		6	Ground	BLK
		7	Ground	BLK
CN2	.093 in 3-Pos Plug Plug: 045-5003-03 Pin: 055-5013-09	1	Line In (100-240 VAC)	BLK
		2	Neutral	WHT
		3	Earth Ground	GRN
CN3	0.084 in 4-Pos Plug Plug: 045-5200-04 Pin: 055-5033-08	1	+48 VDC to CPU Node	GRY
		2	Door Interlock Switch Status	GRY/RED
		3	Line Voltage Status	VIO
		4	Ground	BLK
CN4	0.084 in 6-Pos Plug Plug: 045-5200-06 Pin: 055-5033-08	1	Door Interlock Switch +48V	-
		2	Door Interlock Switch +48V	-
		3	Switched 48V Out (to Node 1)	GRY/YEL
		4	Door Interlock Return Ground	-
		5	Door Interlock Return Ground	-
		6	Ground (to Node 1)	BLK
CN5	0.084 in 12-Pos Plug Plug: 045-5200-12 Pin: 055-5033-08	1	Switched 48V Node Power	GRY
		2	Switched 48V Node Power	GRY
		3	Switched 48V Node Power	GRY
		4	Switched 48V Node Power	GRY
		5	Switched 48V Node Power	GRY
		6	Switched 48V Node Power	GRY
		7	Node Ground	BLK
		8	Node Ground	BLK
		9	Node Ground	BLK
		10	Node Ground	BLK
		11	Node Ground	BLK
		12	Node Ground	BLK
CN6	.156 in 3-Pos Plug: 045-5259-03 Pin:055-5331-00 (18awg)	1	Ground	-
		2	Ground	-
		3	+12VDC	-
CN7	.084 2-Pos Plug: 045-5200-02 Pin:055-5033-08	1	+48 VDC to CPU Node	-
		2	Ground	-

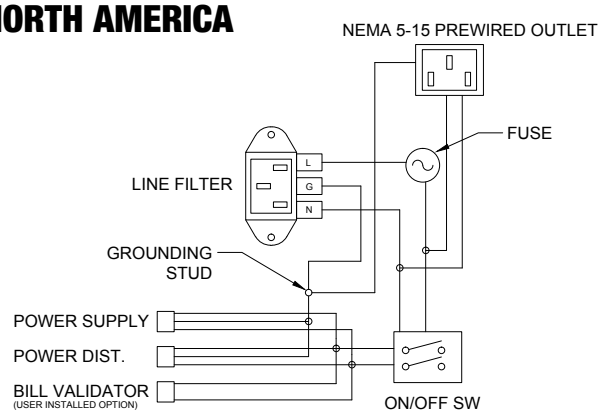
4.19 POWER PLUG WIRING

CAUTION

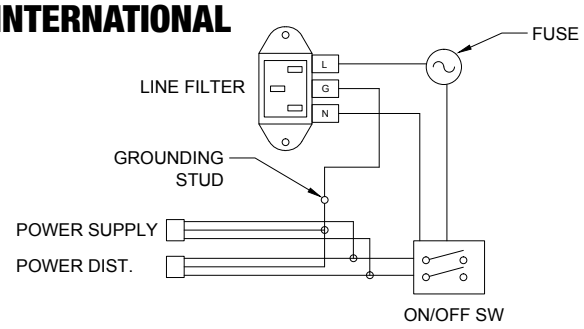
TO MAINTAIN SAFETY, GROUND WIRE FROM LINE FILTER IS TO BE MOUNTED FIRST ON GROUNDING STUD AND SECURED WITH NUT. ALL OTHER GROUNDS MAY THEN BE ATTACHED TO GROUNDING STUD.

REPLACE ALL FUSES WITH CORRECT CURRENT RATINGS!

NORTH AMERICA



INTERNATIONAL



LINE CORDS

Part Number	Description
034-6012-00	Line Cord, 3m, 5-15P USA
034-6012-01	Line Cord, 3m, CEE77P EUROPE
034-6012-02	Line Cord, 3m, BS1363P United Kingdom
034-6012-03	Line Cord, 3m, AS-NZS4417P Australia
034-6012-04	Line Cord, 3m, CEI23-16P Italy
034-6012-05	Line Cord, 3m, SEV1011P Switzerland
034-6012-06	Line Cord, 3m, JIS8303P Japan
034-6012-07	Line Cord, 3m, SI32P Israel
034-6012-08	Line Cord, 3m, BS546P S Africa, India
034-6012-09	Line Cord, 3m, IS6538P S. India

LINE FUSES

Line Voltage (Region)	Fuse Current	Type	Part Number
120V (North America)	8 A	Slow Blow MDL	200-5000-05
220/240v (Europe, Australia, UK)	5 A	Slow Blow MDL	200-5000-01

5. PARTS REFERENCE

5.1 PLAYFIELD RUBBER PARTS

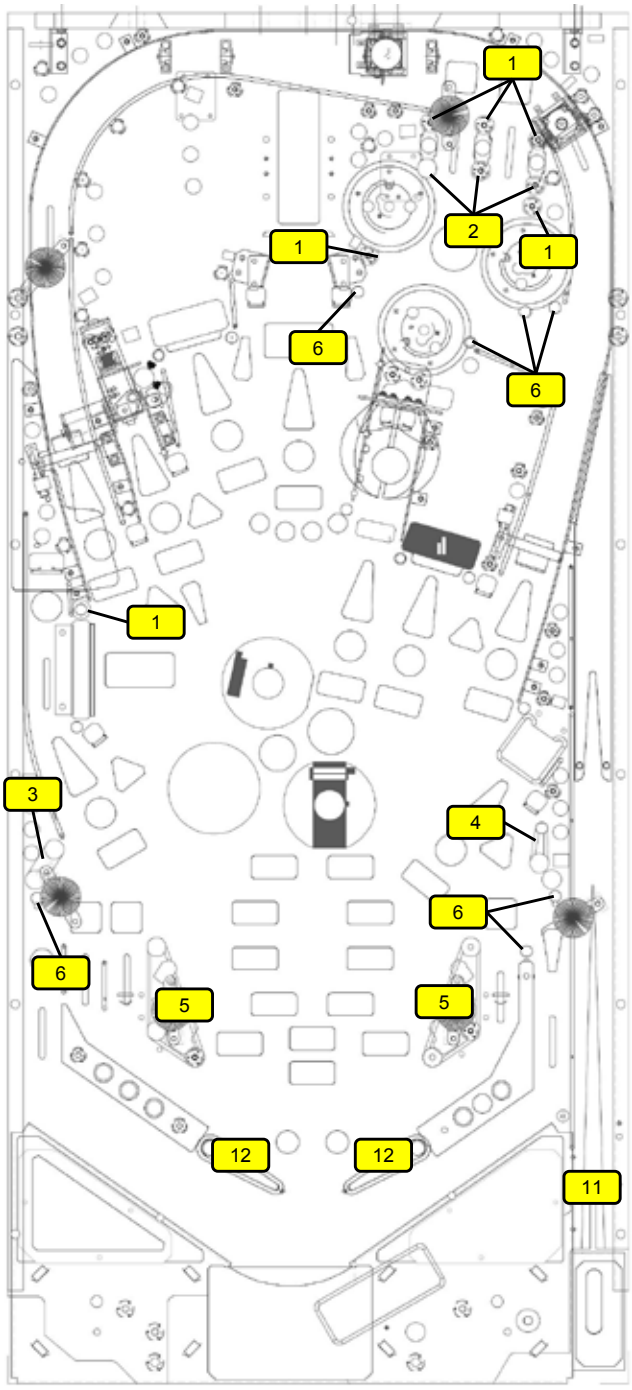


Figure 5.1.1. Rubber o-ring part locations.

RUBBER O-RINGS

ID	Qty	Size (ID)	Size (OD)	Durometer	Color	Part Number
1	6	3/16"		50	Black	545-5348-01
2	3	5/16"		50	Black	545-5348-02
4	1	3/4"		50	Black	545-5348-04
5	1	1"		50	Black	545-5348-05
6	2	2"		50	Black	545-5348-08
7	8		7/16"	50	Black	545-5348-17

Figure 5.1.2. Rubber o-ring part numbers and usage. ID: Inner Diameter, OD: Outer Diameter, Durometer: Higher number is firmer, less bounce, and more durable.

ID	Qty	Description	Color	Part Number
11	1	Plunger Tip	Black	545-5276-00
12	2	Flipper Rubber	Black	545-5277-00
13	6	Bumper Pad (Sub assemblies)	Black	545-5105-00
14	2	Bumper Pad (Flippers)	Black	545-5428-00

Figure 5.1.3. Other rubber part numbers and usage

5.2 RUBBER SIZE CHART

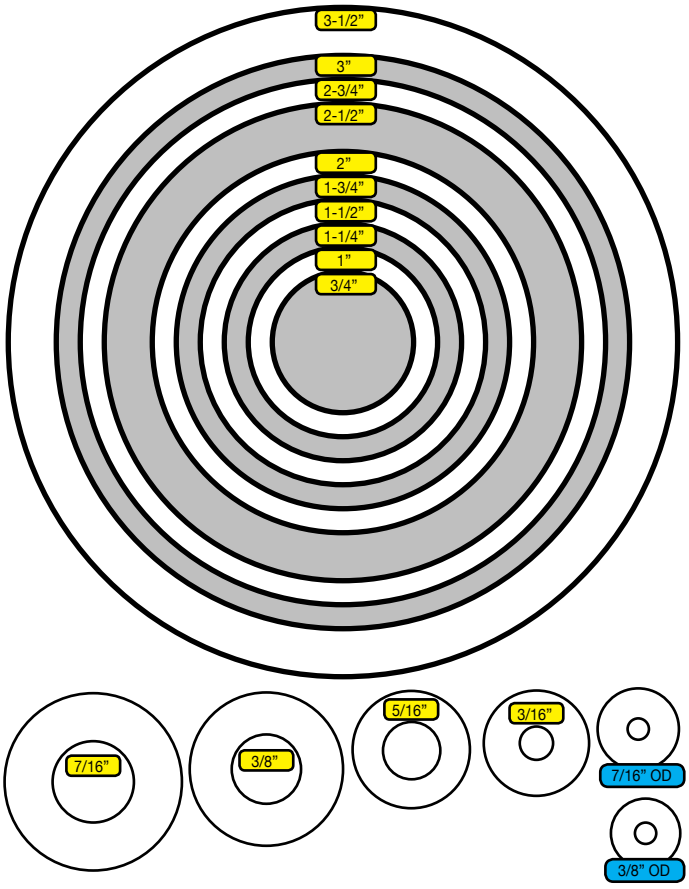


Figure 5.2.1. Rubber ring inner diameter sizing tool. Hold ring up to chart and read largest size on inside of ring. Dimensions are Inner Diameter (ID) unless otherwise noted as Outer Diameter (OD).

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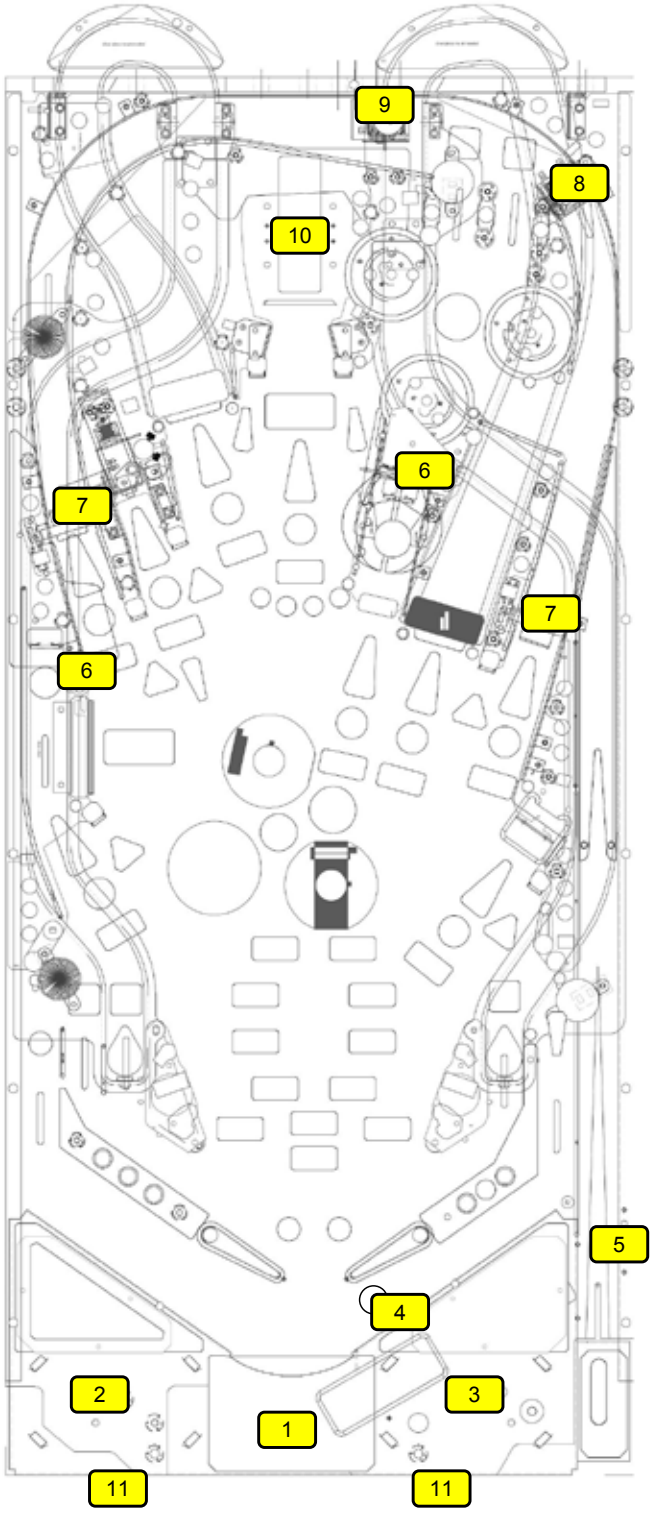
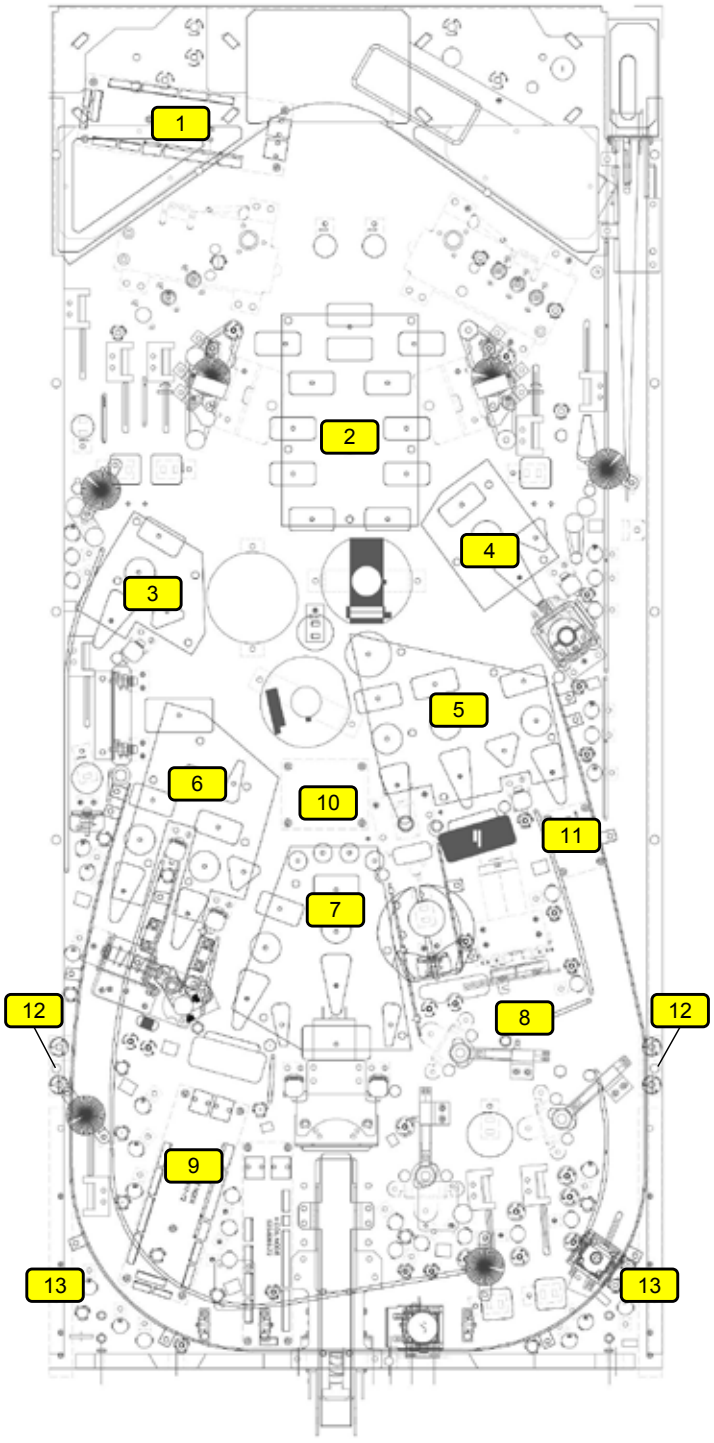
5.3 PLAYFIELD ASSEMBLIES, TOP



ID	Part Number	Description	Qty
1	545-5995-02	Bottom Arch Assembly	1
2	755-51L5-12-Y	Instruction Card	1
3	755-5400-02-Y	Coin Card (USA)	1
4	260-5000-00	Pinballs	6
5	500-6815-00	Bubble Level Assembly	1
6	545-5409-01	Light Reflector	2
7	511-7655-0X	Spinner	2
8	511-7506-03	Electric Gate	1
9	511-5096-00	Electric Gate	1
10	545-9981-01	Groot Head (Drilled)	1
11	535-8385-00	Welded Hanger Bracket	2

Figure 5.3.1. Major playfield assemblies, Top locations.

5.4 PLAYFIELD ASSEMBLIES, BOTTOM



ID	Part Number	Description	Qty
1	520-7017-72	Core-Driver Node 8 Board	1
2	520-7080-00	Lower LED Board 10b	1
3	520-7081-00	Left Lower LED Board 8b	1
4	520-7079-00	Right Lower LED Board 10a	1
5	520-7078-00	Right Upper LED Board 9a	1
6	520-7077-00	Left Upper LED Board 8c	1
7	520-7076-00	Center Upper LED Board 11a	1
8	520-6996-00	Serial Motor Driver Board 9b	1
9	520-7017-72	Core-Driver Node 9 Board	1
10	520-6976-72	SPI Only Node 10 Board	1
11	520-6998-72	Playfield 4 Coil Node 11 Board	1
12	500-5329-00	Pivot Pin	2
13	535-5988-01	Edge Slide Bracket	2

Figure 5.4.1. Major playfield assemblies, Bottom locations.

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5.5 BACKBOX PARTS

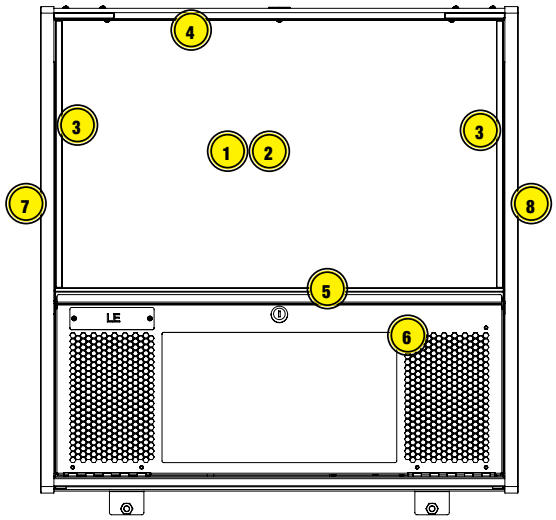


Figure 5.5.1. Backbox external assemblies and components.

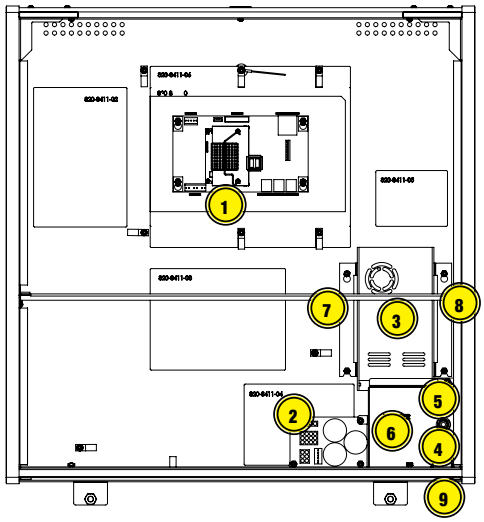


Figure 5.5.2. Backbox internal assemblies and components.

EXTERNAL

ID	Part Number	Description	Qty
1	660-5052-00	Backglass	1
2	830-8426-L6	Mirror Backglass [LE]	1
	830-52L7-00	Translite Art [Premium]	1
3	545-5018-17	Plastic Extrusion 15-.450"	2
4	545-5018-15	Glass Channel 26"	1
5	545-6313-01	Glass Lift Channel 26"	1
6	500-9996-L6	LCD Speaker Panel Assembly	1
7	820-78L6-01	Left Backbox Decal [LE]	1
	820-78L7-01	Left Backbox Decal [Premium]	1
8	820-78L6-02	Right Backbox Decal [LE]	1
	820-78L7-02	Right Backbox Decal [Premium]	1

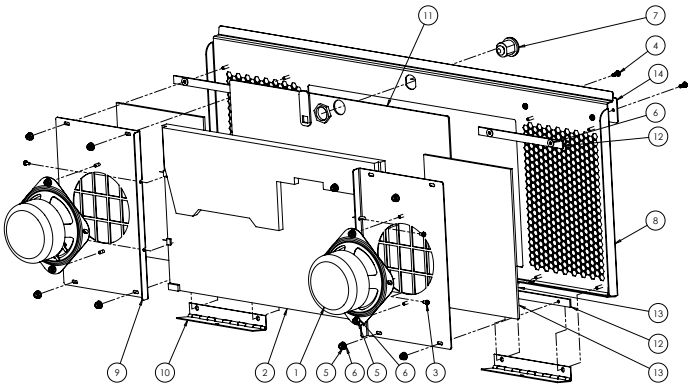
INTERNAL

ID	Part Number	Description	Qty
1	509-1003-01	CPU Node Board	1
2	520-5343-01	Power Distribution Board	1
3	011-5003-00	Power Supply 48V/500W	1
4	515-9769-00	Utility Outlet (USA)	1
5	205-5001-00	Fuse Holder-Screw in	1
	200-5000-05	8A Fuse	1
6	535-1130-00	Cover AC	1
7	535-1129-00	Power supply bracket	1
8	535-1129-01	Power supply bracket	1
9	180-5001-03	Power Switch	1
	034-6012-00	Line Cord-3M 5-15P/C13RA*	1

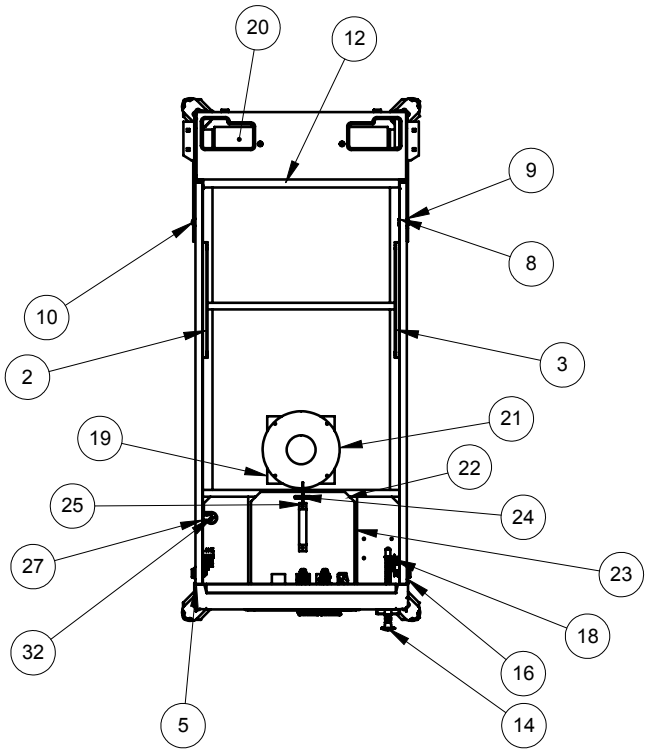
5.6 SPEAKER PANEL PARTS

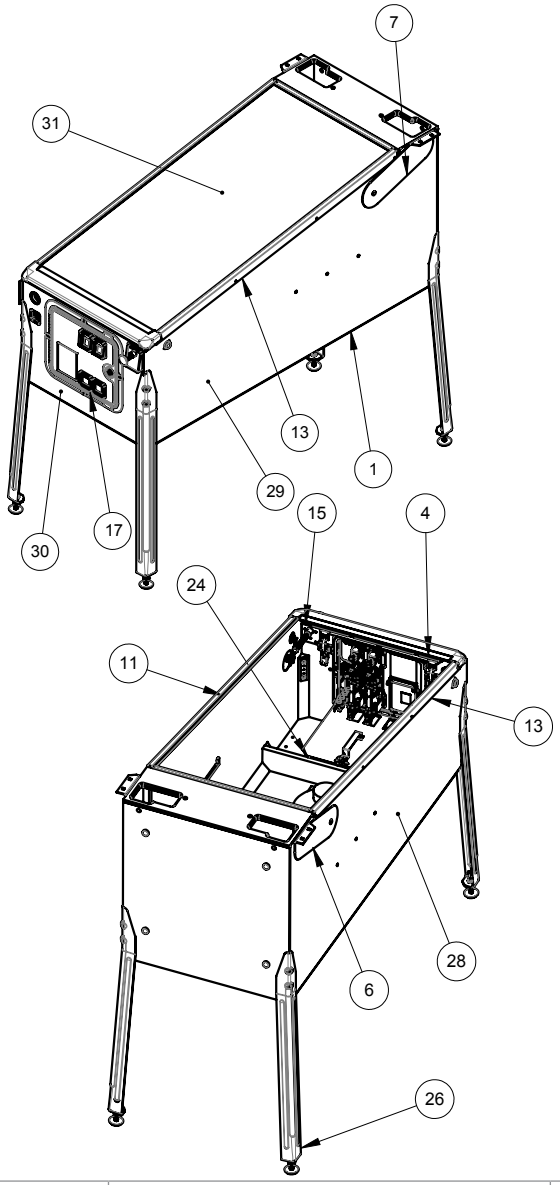
500-9996-L6/L7

ID	Part Number	Description	Qty
1	031-5004-02	Speaker	2
2	116-0023-00	1366 x 768 Display LCD Panel	1
3	237-6188-01	Screw, M3x0.5 X 6MM PPH Sems Zinc	4
4	237-6307-06	6-32 X 3/8" Torx Stainless Steel Screw	2
5	240-5005-00	6-32 Nylon Stop Nut	12
6	242-5001-00	#6 Washer	16
7	355-5168-00-00	Nut: Lock w/ Cam	1
8	515-9842-00	Speaker Panel-LCD	1
9	515-9843-00	Speaker Plate	2
10	515-9845-00	Hinge, Speaker Panel, LCD	2
11	545-9877-00	LCD Window	1
12	545-9877-01	Spacer, Small - LCD Speaker Panel	4
13	626-5109-00	Speaker Foam - LCD Panel	2
14		Logo Plate	1



5.7 CABINET PARTS





ID	Part Number	Description	Qty
1	525-6011-00	Cabinet (Plunger & Two Buttons)	1
2	535-5989-00	Slide & Pivot Bracket - Left Side	1
3	535-5990-00	Slide & Pivot Bracket - Right Side	1
4	515-7792-00	Cabinet Playfield Locking Bar	1
5	500-2464-81	Front Molding Assembly - Goldtastic [LE]	1
	500-2464-00	Front Molding Assembly - Wrinkle Black [Premium]	1
6	535-7999-81L	Pivot Hinge, Left - Goldtastic [LE]	1
	535-7999-00	Pivot Hinge, Left - Wrinkle Black [Premium]	1
7	535-7999-81R	Pivot Hinge, Right - Goldtastic [LE]	1
	535-7999-01	Pivot Hinge, Right - Wrinkle Black [Premium]	1
8	254-5042-00	Spacer Nut, Hex, 1/2"OD, 1/4-20	2
9	242-5084-00	Washer, 1/2" I.D., 3/16" THK	2
10	231-5072-00	1/4-20 X 1/2" Carriage Bolt	2
11	545-5017-00	Plastic Channel	2
12	545-9802-00	Glass Rear Extrusion	1
13	535-9596-81L	Side Armor Left - Goldtastic [LE]	1
	535-9596-81R	Side Armor Left - Goldtastic [LE]	1
	535-7297-02	Side Armor - Wrinkle Black [Premium]	2
14	500-6146-00-07	Ball Shooter Assembly	1
15	535-5027-01	Plunger Support Plate, Notched	1
16	500-5026-32	Flipper Button Assembly (Red) [LE]	2
	500-5026-38	Flipper Button Assembly (White) [Premium]	2
17	501-5018-173	Coin Door 2-Chute No Emboss	1
18	180-5160-01	Flipper Switch, Single	2
19	545-5072-03	Grill - Speaker / Vent	1
20	545-5072-02	Grill - Speaker / Vent	1
21	031-5007-01	Speaker, Cabinet 8" Round, 4 ohm	1
22	545-5090-00	Cash Box - Plastic	1
23	535-5013-03	Cash Box Cover	1
24	535-7562-00	Cash Box Lock Bracket Wire	1
25	535-7772-00	Hair Pin Clip	1
26	500-5921-81	Leg Assembly - Goldtastic [LE]	4
	500-5921-50	Leg Assembly - Wrinkle Black [Premium]	4
27	516-0007-00	Tilt Assembly	1
28	820-78L6-03	Decal, Cabinet Left, Guardians of the Galaxy LE	1
	820-78L7-03	Decal, Cabinet Left, Guardians of the Galaxy Premium	1
29	820-78L6-04	Decal, Cabinet Right, Guardians of the Galaxy LE	1
	820-78L7-04	Decal, Cabinet Right, Guardians of the Galaxy Premium	1
30	820-78L6-05	Decal, Cabinet Front, Guardians of the Galaxy LE	1
	820-78L7-05	Decal, Cabinet Front, Guardians of the Galaxy Premium	1
31	660-5001-00	Playfield Glass	1
32	520-6967-72	Cabinet Node Board	1
	820-78L6-XX 820-78L7-XX	Cabinet Decal Replacement Set	

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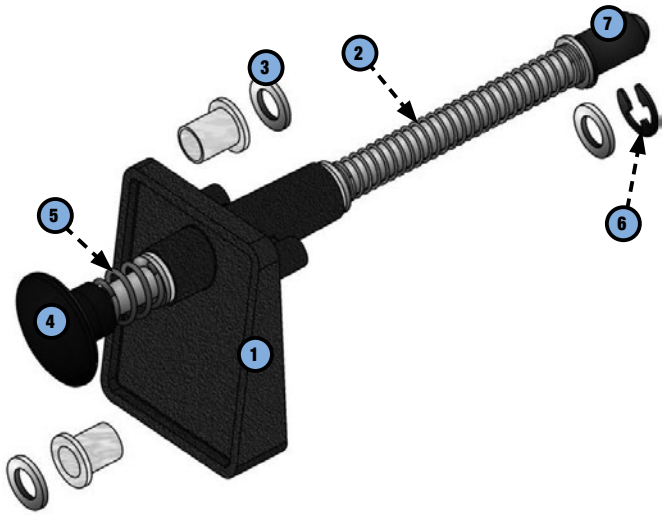
5.8 BALL SHOOTER ASSEMBLY

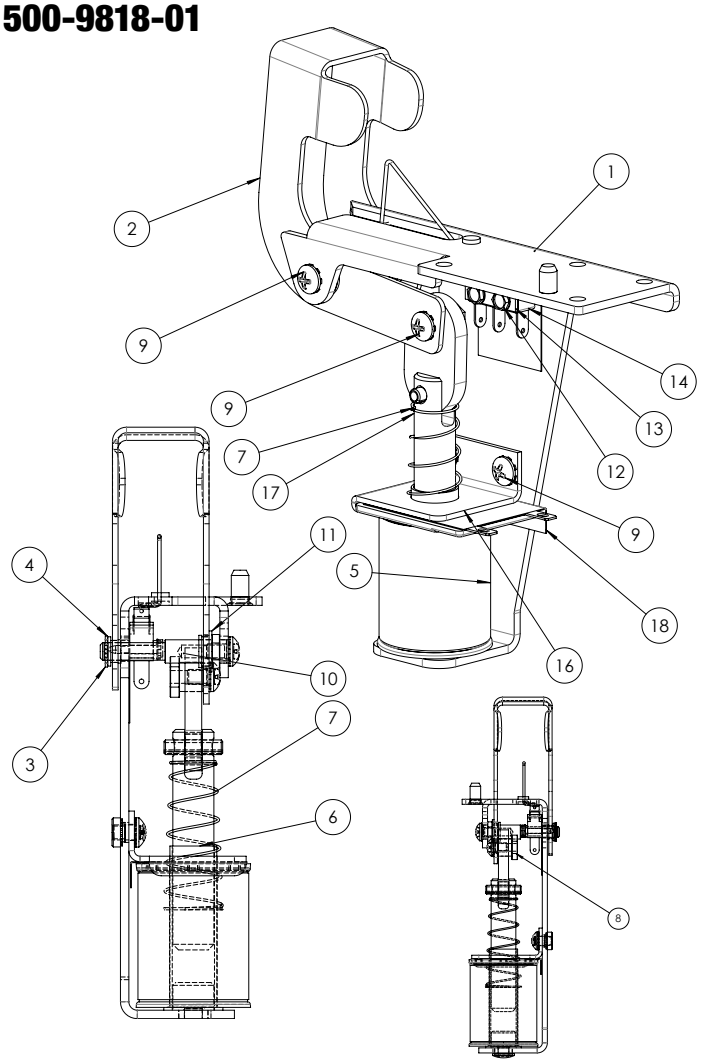
500-6146-00-07



ID	Part Number	Description	Qty
1	535-5067-02	Housing Assembly	1
2	266-5001-07	Compressed Spring (Long) - Orange	1
3	242-5014-00	Washer 3/8 ID x 5/8 OD x 1/16	3
4	515-6557-00	Rod Assembly	1
5	266-5010-00	Compressed Spring (Short)	1
6	270-5012-00	Retaining Ring, 3/8"	1
7	545-5276-00	Rubber Tip	1

5.9 AUTO LAUNCH ASSEMBLY

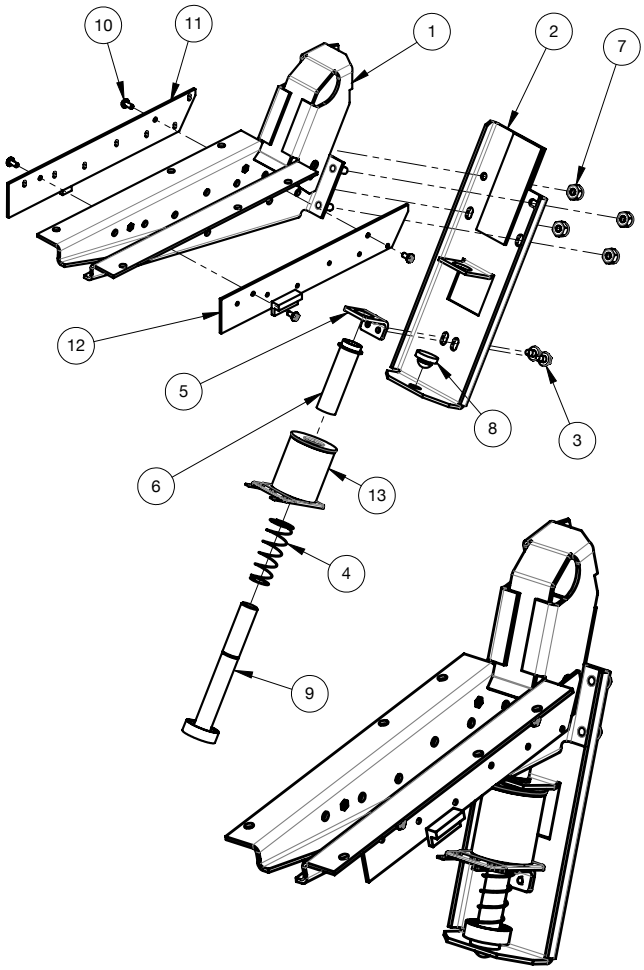
500-9818-01



ID	Part Number	Description	Qty
1	515-9689-00	MAIN BRKT: AUTO-PLUNGER	1
2	535-0728-00	KICKER ARM, AUTO-PLUNGER	1
3	270-5001-00	RETAINING E-RING, 3/16" SHAFT OD	1
4	545-5352-00	NYLINER, 3/16" SHAFT	1
5	090-5001-ND	COIL - 23-800, NO DIODE	1
6	545-5411-00	COIL SLEEVE	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	530-7834-00	PIN: KICKER ARM, AUTO-PLUNGER	1
9	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	4
10	530-7835-00	PIVOT, AUTO-PLUNGER	1
11	545-5423-00	NYLINER, 1/4" SHAFT, 4L1-FF	1
12	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	2
13	535-6539-00	SWITCH BODY PROTECT PLATE	1
14	180-5157-01	SHOOTER SWITCH - SHORT ARM	1
15	545-6268-00	FISCHE PAPER	1
16	535-0762-00	COIL BRACKET-AUTOPLUNGER	1
17	515-6304-03	PLUNGER / LINK ASSEMBLY	1
18	545-0762-00	FISCHE PAPER: AUTO-LAUNCHER	1

5.10 BALL TROUGH ASSEMBLY

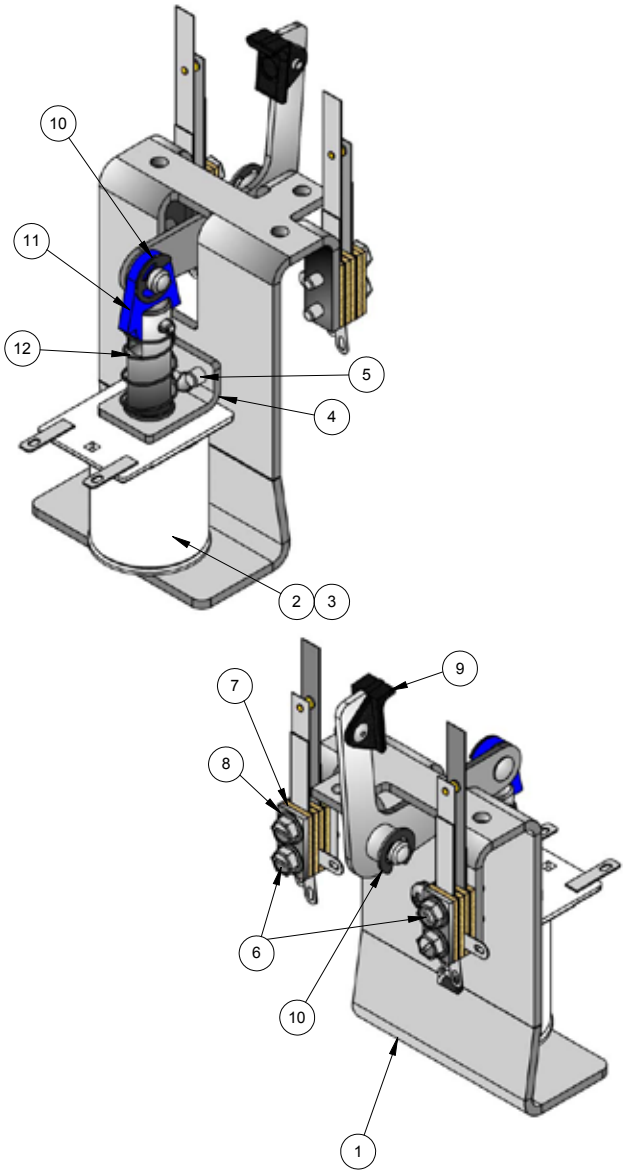
500-9820-00



ID	Part Number	Description	Qty
1	515-7811-00	MAIN BRKT. BALL TROUGH	1
2	515-7812-00	COIL BRACKET, BALL TROUGH	1
3	237-5975-04	SCREW, 8-32 X 1/4" HWH SWAGE SERR	2
4	266-5020-00	COMPRESSION SPRING-CONICAL	1
5	535-5203-03	COIL RETAINING BRACKET	1
6	545-5076-01	COIL SLEEVE	1
7	240-5102-00	8-32 NYLON LOCK NUT	4
8	545-5105-00	RUBBER BUMPER	1
9	515-7309-01	PLUNGER ASSEMBLY	1
10	237-5909-00	SCREW, 4-40 X 1/4" PPH SEMS	4
11	520-5344-00	TROUGH BOARD #1 - ILED TRANSMITTER	1
12	520-7001-00	TROUGH BOARD #2 - RECEIVER	1
13	090-5004-ND	COIL 27-1500 - NO DIODE	1
98*	605-5006-00	SHRINK TUBING 1/8"	.42 FT.
99*	036-5611-11-F5	CABLE TROUGH OPTOS	1

5.11 SLINGSHOT ASSEMBLY

500-9920-01



ID	Part Number	Description	Qty
1	515-5339-01	SLINGSHOT BRACKET ASSEMBLY	1
2	090-5044-ND	COIL 26-1200 - NO DIODE	1
3	545-5031-00	COIL SLEEVE	1
4	535-5203-03	COIL RETAINER BRACKET	1
5	232-5301-00	8-32 X 3/8 PPH MS EXT SEMS ZC	2
6	180-5231-00	SWITCH SLING SHOT 2 LUG CENTER	2
7	535-5045-00	SWITCH PLATE	2
8	237-5976-04	6-32 X 5/8 SLOT SER HWH SW	4
9	515-5340-01	ARM & TIP ASSEMBLY	1
10	270-5002-00	RETAINING RING - 1/4 DIA	2
11	515-5338-00	PLUNGER & LINK ASSEMBLY	1
12	266-5020-00	COMP SPRING CONICAL	1
13	036-5604-00	4" GENERIC JUMPER	2

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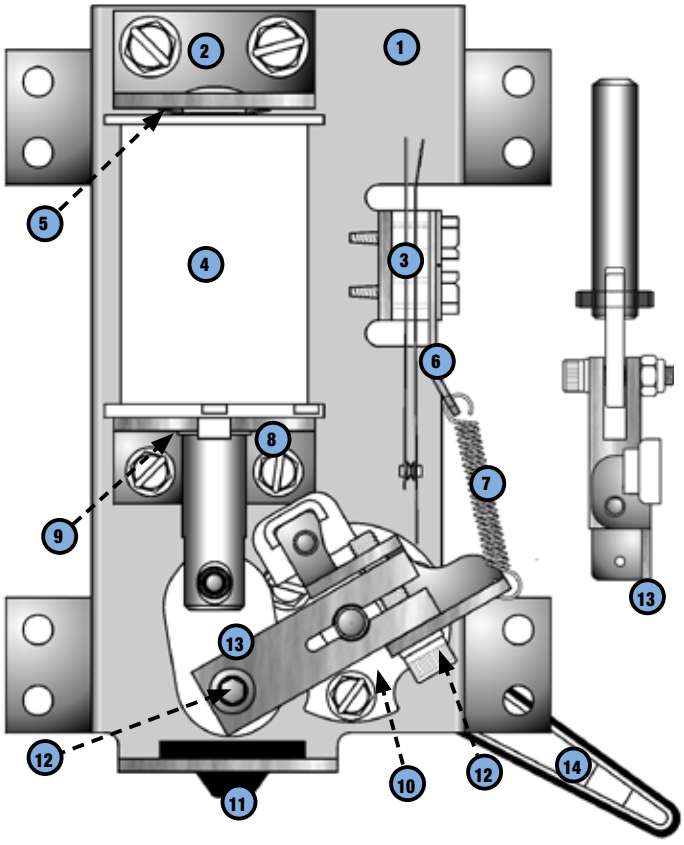
5.12 FLIPPER ASSEMBLY, LEFT

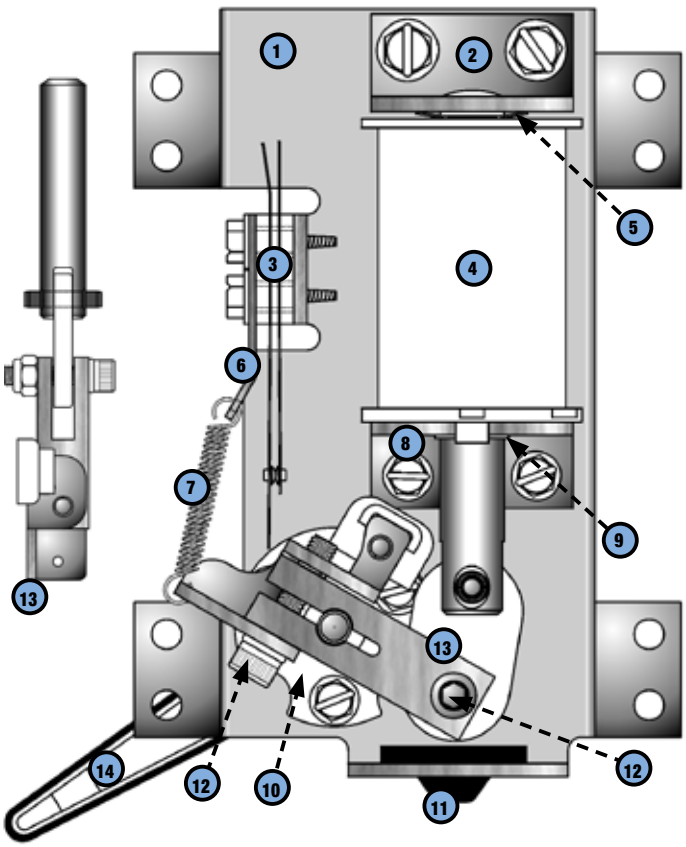
500-6543-14-ND



ID	Part Number	Description	Qty
1	515-6617-01	FLIPPER BASE PLATE LEFT KIT W/ BRACKET MOUNT HARDWARE	1
2	515-6308-01	COIL STOP BRACKET	1
3	180-5149-00	SWITCH - END OF STROKE N/C	1
4	090-5030-ND	COIL	1
5	269-5002-00	SPRING WASHER	1
6	535-7354-00	SWITCH RETURN SPRING BRACKET	1
7	265-5035-00	SPRING FLIPPER RETURN	1
8	535-7356-00	COIL SUPPORT BRACKET	1
9	545-5388-00	COIL SLEEVE, FLIPPER	1
10	545-5070-00	FLIPPER BAT BUSHING	1
11	545-5428-00	FLIPPER BUMPER PAD	1
12	237-6144-00	SET SCREW #10-32 x 3/4" SOCKET	2
13	515-7203-01	PLUNGER/CRANK ASSEMBLY, LEFT	1
14	515-5133-08-06	FLIPPER BAT AND SHAFT*	1
	500-6307-10	FLIPPER REBUILD KIT, LEFT	
		* Refer to game rubber chart for flipper rubber color and part number.	

5.13 FLIPPER ASSEMBLY, RIGHT

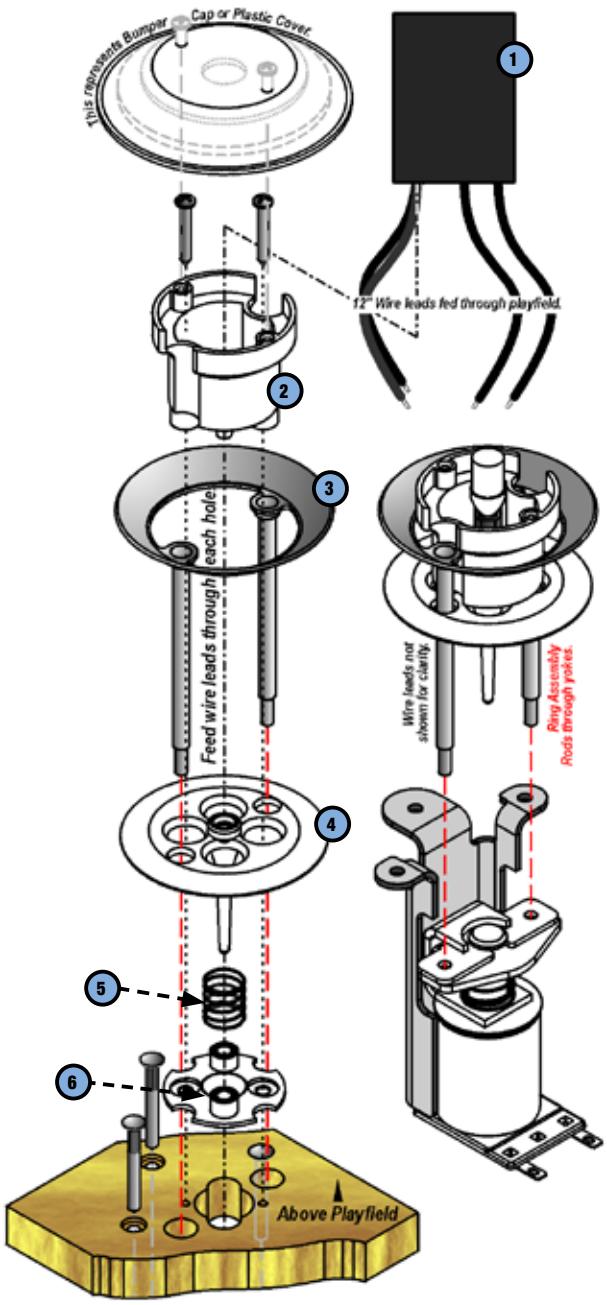
500-6543-04-ND



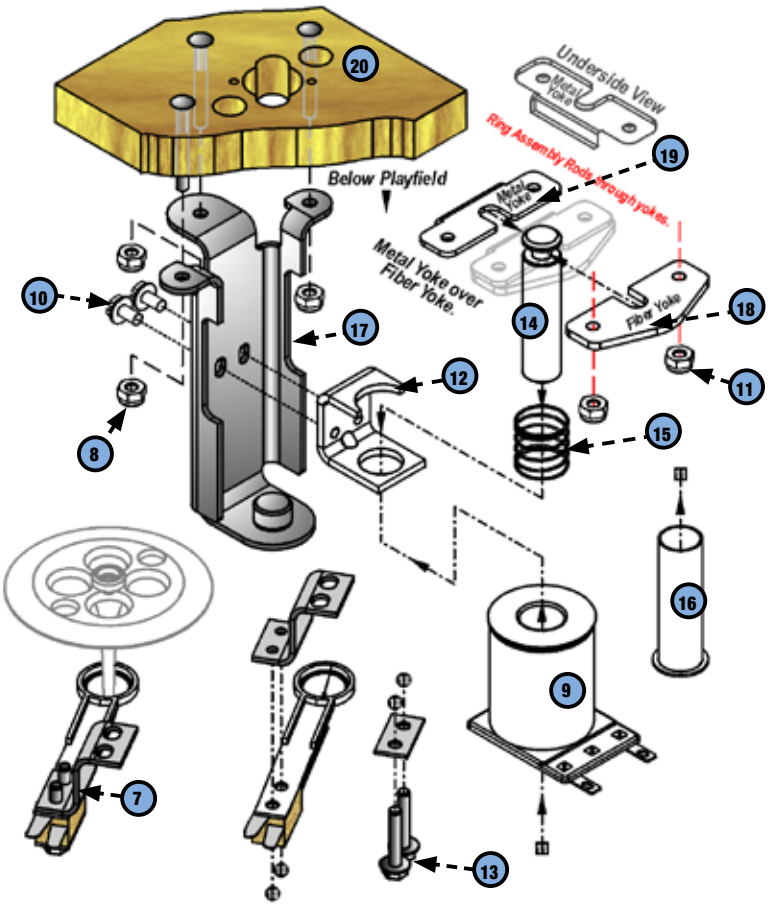
ID	Part Number	Description	Qty
1	515-6617-00	FLIPPER BASE PLATE RIGHT KIT W/ BRACKET MOUNTING HARDWARE	1
2	515-6308-01	COIL STOP BRACKET	1
3	180-5149-00	SWITCH - END OF STROKE N/C	1
4	090-5030-ND	COIL	1
5	269-5002-00	SPRING WASHER	1
6	535-7354-00	SWITCH RETURN SPRING BRACKET	1
7	265-5035-00	SPRING FLIPPER RETURN	1
8	535-7356-00	COIL SUPPORT BRACKET	1
9	545-5388-00	COIL SLEEVE, FLIPPER	1
10	545-5070-00	FLIPPER BAT BUSHING	1
11	545-5428-00	FLIPPER BUMPER PAD	1
12	237-6144-00	SET SCREW #10-32 x 3/4" SOCKET	2
13	515-7203-00	PLUNGER/CRANK ASSEMBLY	1
14	515-5133-08-06	FLIPPER BAT AND SHAFT*	1
	500-6307-00	FLIPPER REBUILD KIT, RIGHT	
		* Refer to game rubber chart for flipper rubber color and part number.	

5.14 POP BUMPER ASSEMBLY

516-6784-XX


This represents Bumper Cap or Plastic Cover
12" Wire leads fed through playfield.
Feed wire leads through each hole
Wire leads not shown for clarity.
Ring Assembly Rods through yokes.
Above Playfield

ID	Part Number	Description	Qty
1	520-5307-03	POP BUMPER LED MODULE	1
2	545-5197-00	BUMPER BODY	1
3	515-5085-00	RING AND ROD ASSY	1
4	545-5607-00	BUMPER SKIRT	1
5	266-5048-00	BUMPER SKIRT COMP SPRING	1
6	545-5195-00	BUMPER BASE	1



Part Number	Description	Qty
515-6459-01L	BUMPER/RING TOP ASSY, W/ LED 1	1
515-6459-04-ND	BUMPER BOTTOM ASSY, NO DIODE	1

ID	Part Number	Description	Qty
7	500-9934-01	POP BUMPER SWITCH ASSY-2 - LUG-LEFT	1
8	240-5005-00	6-32 NYLON STOP NUT	3
9	090-5044-ND	COIL - 26-1200	1
10	237-5976-01	#6-32 X 1/4" SHWH SWAGE ZN	2
11	240-5005-00	#6-32 NYLON STOP NUT	2
12	535-7347-00	METAL YOKE STOP	1
13	234-5101-00	* 8 X 1/2 SLT	6
14	530-5348-00	PLUNGER, POP BUMPER	1
15	266-5047-00	COMPRESSION SPRING, POP BUMPER	1
16	545-5031-00	COIL SLEEVE	1
17	515-5939-00	COIL BRACKET POP BUMPER ASSY	1
18	545-5609-00	FIBER YOKE	1
19	535-7346-00	METAL YOKE	1
20	237-5957-00	#6-32 x 1-3/16" SPIRAL FIN SHANK SCREW	3

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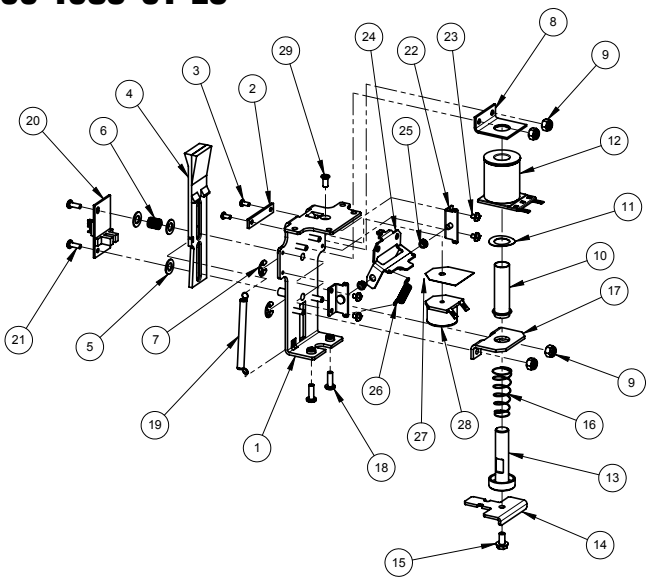
5.15 1-BANK DROP TARGET ASSEMBLY

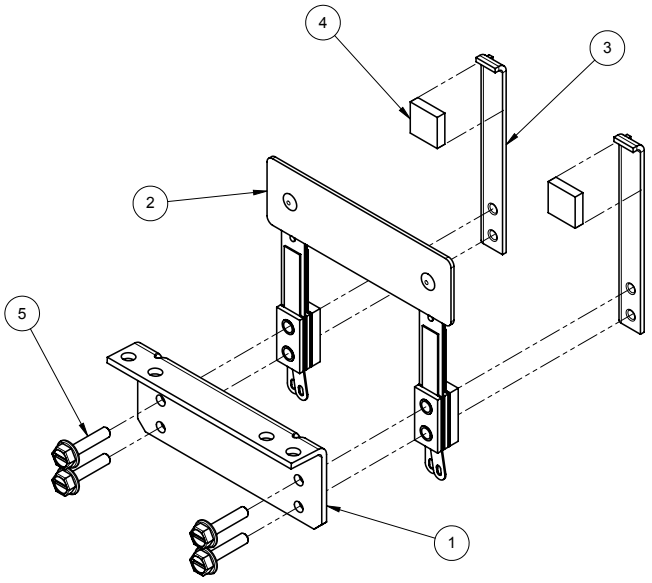
500-1083-01-L6



ID	Part Number	Description	Qty
1	515-0185-L6	FRAME ASSY, NOTCHED, 1-BANK DT W/ TRIP, GOTG	1
2	545-6163-01	LEDGE, 1-BANK DROP TARGET	1
3	237-6169-00	SCREW, 4-40 X 1/4 PPH MS	2
4	545-6305-00	TARGET - ROLLOVER - BLACK	1
5	242-5091-00	WASHER, 1/2 X 17/64 X .03 - DT	3
6	266-5089-00	SPRING COMPRESSION - DT	1
7	270-5002-00	RETAINING RING - 1/4"	2
8	535-9959-00	STOP BRKT	1
9	240-5102-00	8-32 NYLON LOCK NUT	4
10	545-5076-01	COIL SLEEVE	1
11	269-5002-00	SPRING WASHER	1
12	090-5034-ND	COIL 25-1240 - NO DIODE	1
13	530-5757-00	PLUNGER - D.T. ASSY.	1
14	535-9760-01A	LIFT BRKT - 1 BANK	1
15	237-5985-00	SCREW, 10-32 X 3/8" HWH SWAGE	1
16	266-5020-00	COMPRESSION SPRING-CONICAL	1
17	535-9777-01	COIL BRACKET-DT-OD	1
18	237-5602-00	SCREW, 8-32 X 1/2" PPH MS ZINC	2
19	265-5003-03	TARGET RESET SPRING	1
22	237-5501-00	SCREW, 6-32 X 3/8" PPH MS ZINC	2
21	520-5252-01	1 BANK DROP TARGET PCB-OPTO	1
20	520-5252-01	1 BANK DROP TARGET PCB-OPTO	1
20	520-5252-01	1 BANK DROP TARGET PCB-OPTO	1
21	237-5501-00	SCREW, 6-32 X 3/8" PPH MS ZINC	2
22	515-9960-00	PIVOT BRACKET - RESET D.T.	2
23	232-5209-00	SCREW, 6-32 X 3/16" PPH SEMS	4
24	535-1660-00	BRACKET, 1-BANK DT TRIP	1
25	545-9794-00	SPLIT BEARING - 4MM	2
26	265-5002-00	TRIP SPRING - TARGET	1
27	545-9930-00	FISCHE PAPER	1
28	090-5031-00-ND	COIL, 32-1800, NO DIODE	1
29	237-6030-00	SCREW, 8-32 X 3/8" PFH 82° U/C MS	1

5.16 DUAL TARGET ASSEMBLY

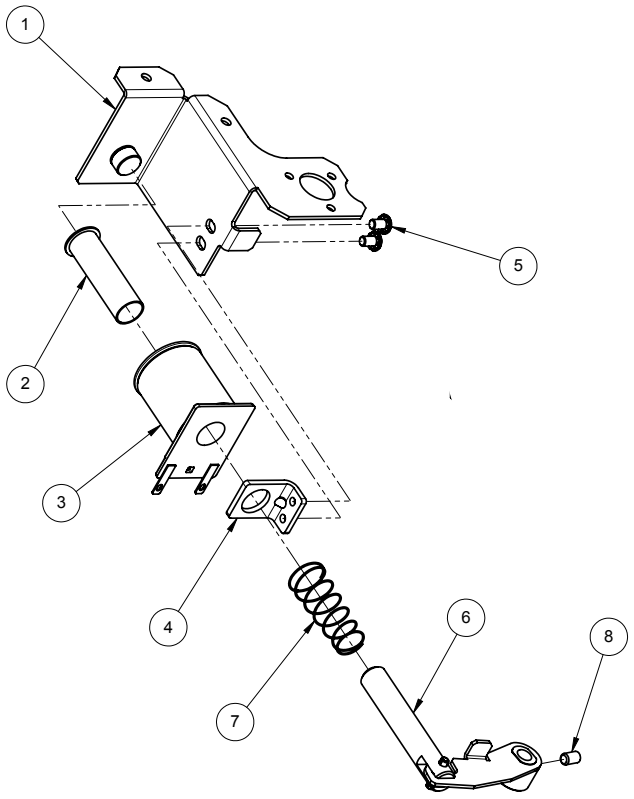
511-9979-00



ID	Part Number	Description	Qty
1	535-0699-00	FUEL TARGET BRACKET	1
2	510-7730-00	RIVETED ASSEMBLY, DUAL-TARGET	1
3	535-9823-01	SWITCH BACK PLATE	2
4	626-5029-00	FOAM PAD	2
5	237-5976-04	SCREW, 6-32 X 5/8" HWH SWAGE	4

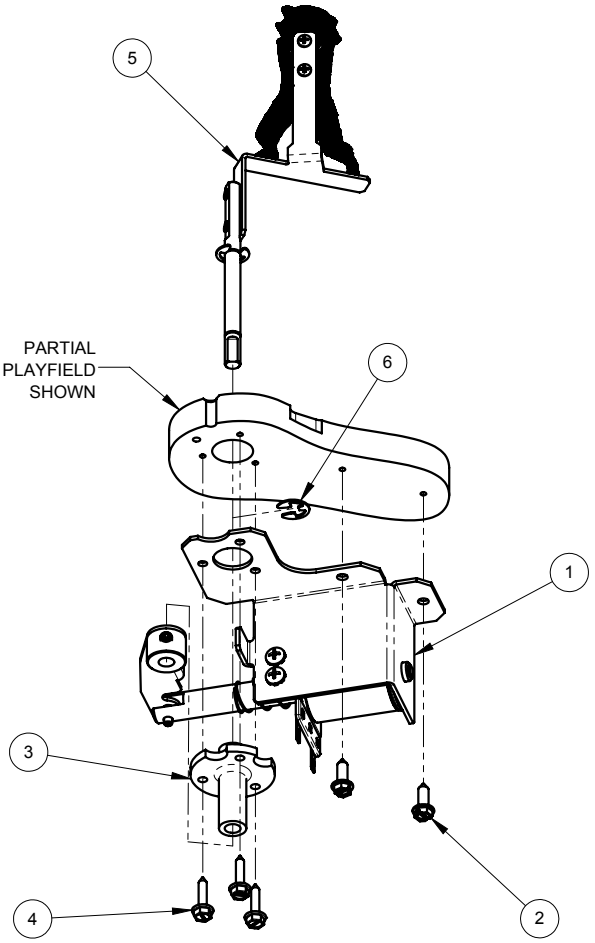
5.17 ROCKET RACCOON COIL ASSEMBLY

500-2466-00



ID	Part Number	Description	Qty
1	515-1839-00	ASSEMBLY, RR COIL BRACKET, GOTG LE	
2	545-5031-00	COIL SLEEVE	1
3	090-5044-ND	COIL 26-1200 - NO DIODE	1
4	535-5203-03	COIL RETAINING BRACKET	1
5	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
6	511-9976-00	ASSEMBLY, RR CRANK & PLUNGER, GOTG LE	1
6a	530-5025-08	STEEL PLUNGER	1
6b	515-1840-00	ASSEMBLY, RR CRANK ARM, GOTG LE	1
6c	251-5008-00	ROLL PIN, 1/8 X 5/8	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	237-6092-00	SET SCREW, 10-32 X 5/16, SOCKET CUP PT	1

5.18 ROCKET RACCOON REFERENCE ASSEMBLY



ID	Part Number	Description	Qty
1	500-2466-00	ASSEMBLY, RR COIL & BRKT, GOTG LE	1
2	234-5101-00	SCREW, #8 X 1/2" SLT HWH AB ZINC	2
3	545-5070-00	FLIPPER BUSHING	1
4	234-5002-00	SCREW, #6 X 5/8" HWH	3
5	511-9999-00	ASSEMBLY, RR & SHAFT, GOTG LE	1
6	270-5002-00	RETAINING RING - 1/4"	1
7	830-51L6-00_board	PLAYFIELD ROUT ONLY, GOTG LE (#L6)	1

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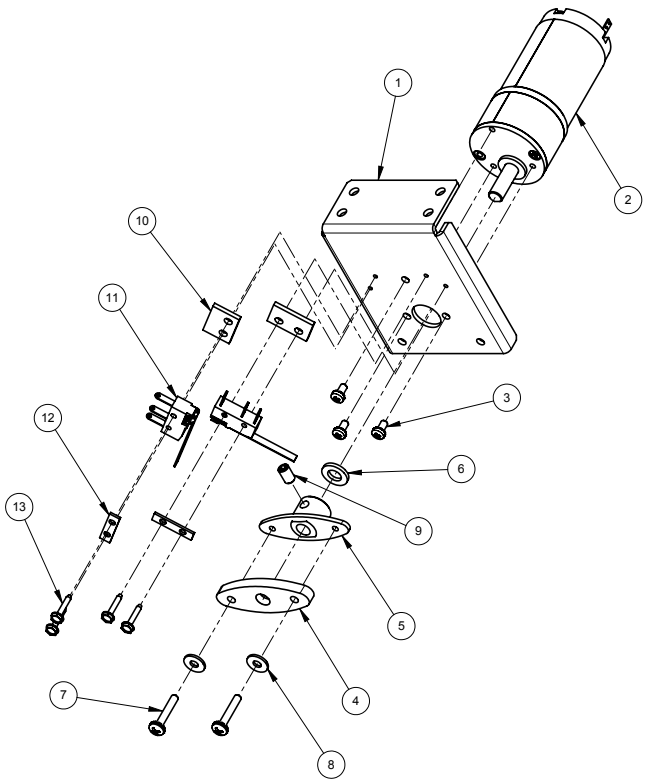
5.19 ORB MOTOR ASSEMBLY

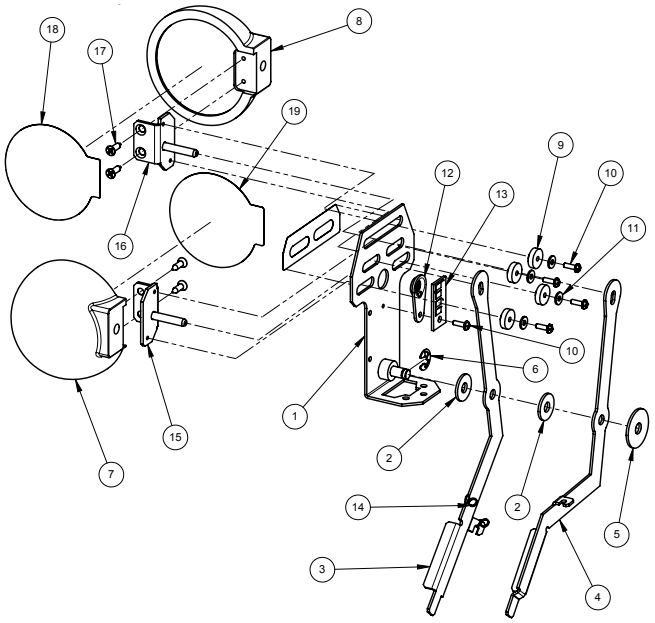
511-9977-00



ID	Part Number	Description	Qty
1	535-1667-00	BRACKET, ORB MOTOR MOUNT, GOTG	1
2	511-1081-00-00	MOTOR ASSY W/ CABLE TIE, 13 RPM / 24 VDC	1
3	237-6188-01	SCREW, M3x0.5 X 6MM PPH SEMS ZINC	3
4	545-9976-00	CAM, ORB MOTOR, GOTG LE	1
5	515-1841-00	ASSEMBLY, ORB MOTOR CAM, GOTG LE	1
6	242-5072-01	NYLON WASHER .252 ID X .472 OD	1
7	232-5204-00	SCREW, 6-32 X 3/4" PPH SEMS	2
8	242-5001-00	#6 WASHER	2
9	237-6092-00	SET SCREW, 10-32 X 5/16, SOCKET CUP PT	1
10	830-6117-00	SWITCH SPACER	2
11	180-5010-02	MICRO-SWITCH	2
12	535-6539-00	SWITCH BODY PROTECT PLATE	2
13	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	4
97*	605-5002-16	HEAT SHRINK TUBING 9/16" L	2
98*	036-6271-12	CABLE, 12" GENERIC MOTOR 4-PIN	1
99*	036-6277-25-L6	CABLE, MOTOR SWITCH	1

5.20 ORB SCISSOR ASSEMBLY

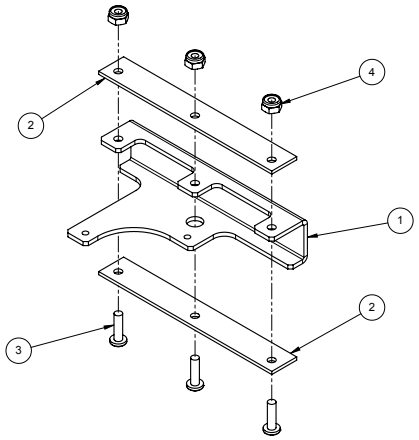
511-9978-00



ID	Part Number	Description	Qty
1	515-1842-00	ASSEMBLY, ORB PIVOT BRACKET, GOTG LE	1
2	242-5028-00	WASHER NYLON .265 X .688 X .063	2
3	535-1671-00	BRACKET, ORB RIGHT SCISSOR, GOTG LE	1
4	535-1669-00	BRACKET, ORB LEFT SCISSOR, GOTG LE	1
5	242-5009-00	WASHER, 1/4" ID X 1" OD X .048" THICK	1
6	270-5002-00	RETAINING RING - 1/4"	1
7	545-9977-01-01	ORB RIGHT HALF, MODIFIED, GOTG	1
8	545-9977-00-01	ORB LEFT HALF, MODIFIED, GOTG	1
9	545-9986-00	SLIDER BLOCK, ORB, GOTG LE	4
10	237-5909-01	SCREW, 4-40 X 3/8" PPH SEMS	5
11	242-5002-00	#4 FLAT WASHER - 5/16" O.D.	4
12	550-7361-09	MINI DOME-LED, PURPLE	1
13	520-5333-00	SINGLE RGB BOARD	1
14	265-5003-04	TARGET RESET SPRING	1
15	535-1801-01	BRACKET, RIGHT ORB HOLDER, GOTG LE	1
16	535-1801-00	BRACKET, LEFT ORB HOLDER, GOTG LE	1
17	237-5800-00	SCREW, #6 X 1/2" PFH ZINC	4
18	820-1029-00	DECAL, ORB LEFT, GOTG	1
19	820-1029-01	DECAL, ORB RIGHT, GOTG	1
20	820-8620-00	CLEAR DECAL, ORB BRACKET, GOTG LE	1
98*	040-5001-00B	CABLE TIE 4" BLACK	2
99*	036-6277-18-L5	ORB RGB CABLE	1

5.21 ORB ARM GUIDE ASSEMBLY

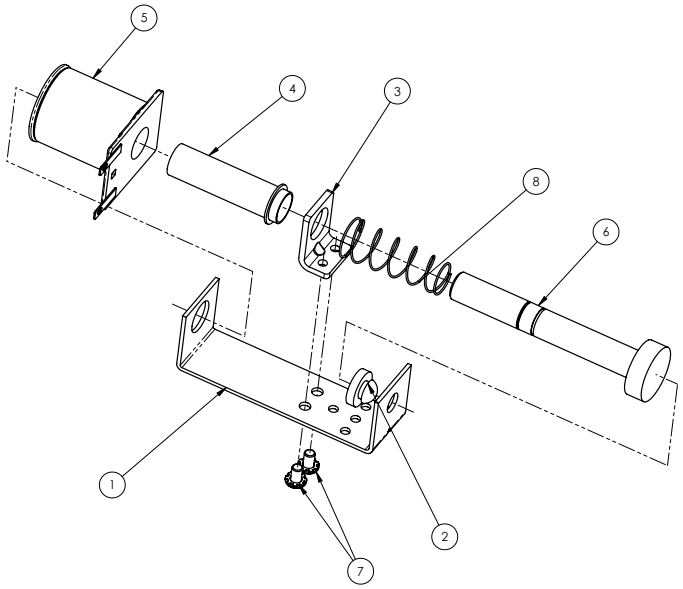
511-1082-00



ID	Part Number	Description	Qty
1	535-1765-00	BRACKET, ORB GLIDE MOUNT, GOTG LE	1
2	545-1024-00	GLIDE STRIP, ORB ARM, GOTG LE	2
3	237-5502-00	SCREW, 6-32 X 1/2" PPH MS ZINC	3
4	240-5005-00	6-32 NYLON STOP NUT	3

5.22 KICKER ASSEMBLY

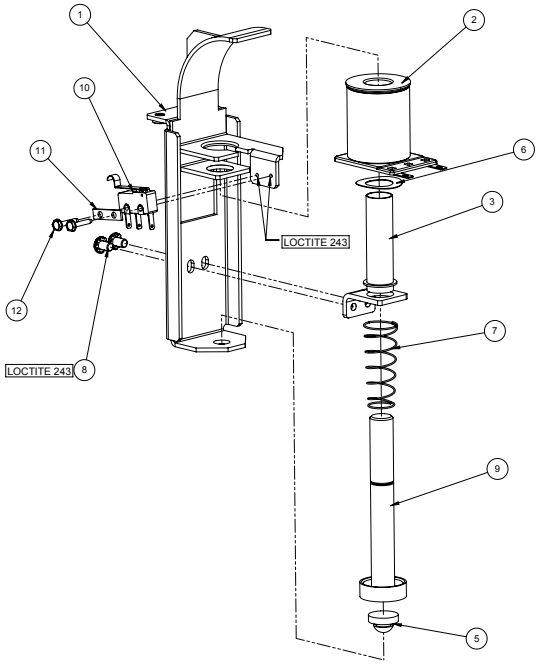
500-6697-02-ND



ID	Part Number	Description	Qty
1	535-6730-00	FRAME - KICK BIG BRACKET	1
2	545-5105-00	RUBBER BUMPER	1
3	535-5203-03	COIL RETAINING BRACKET	1
4	545-5076-01	COIL SLEEVE	1
5	090-5001-ND	COIL - 23-800, NO DIODE	1
6	515-7318-00	PLUNGER ASSEMBLY	1
7	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
8	266-5020-00	COMPRESSION SPRING-CONICAL	1
NOT SHN	036-5542-00	CABLE - GENERIC - COIL	1

5.23 EJECT VUK

500-1050-00



ID	Part Number	Description	Qty
1	515-9984-00	BRACKET - EJECT	1
2	090-5004-ND	COIL 27-1500 - NO DIODE	1
3	545-5076-01	COIL SLEEVE	1
4	535-5203-03	COIL RETAINING BRACKET	1
5	545-5105-00	RUBBER BUMPER	1
6	269-5002-00	SPRING WASHER	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
9	515-7309-00	PLUNGER ASSEMBLY	1
10	180-5209-00	SUB MINIATURE SWITCH - SIM. ROLLER	1
11	535-6539-00	SWITCH BODY PROTECT PLATE	1
12	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	2
	036-5541-00	GENERIC COIL CABLE	1

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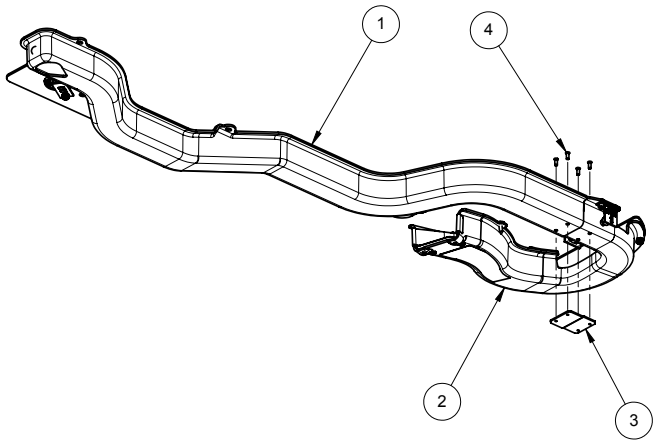
5.24 LEFT RAMP ASSEMBLY

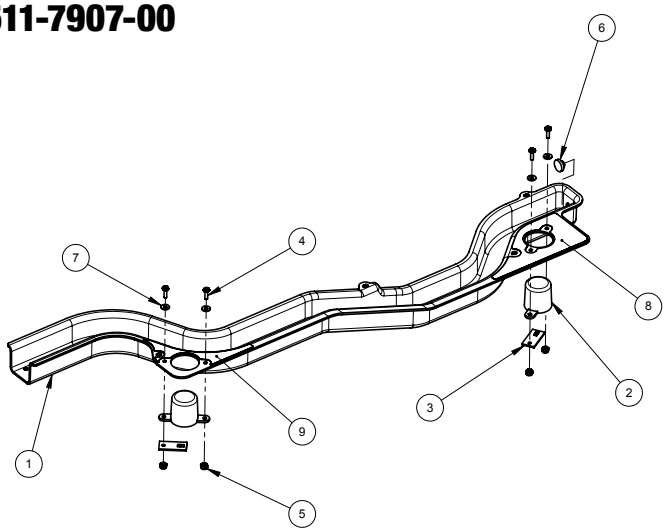
500-1069-00



ID	Part Number	Description	Qty
1	511-7907-00	ASSEMBLY, LEFT RAMP EXIT, GOTG	1
2	511-7906-00	ASSEMBLY, LEFT RAMP ENTRANCE, GOTG LE	1
3	535-0546-00	RAMP BRIDGE PLATE	1
4	237-6151-00	SCREW, 4-40 X 5/16" PFH U/C MS	4
99*	040-5001-00B	4" CABLE TIE, BLACK	1

5.25 LEFT RAMP EXIT ASSEMBLY

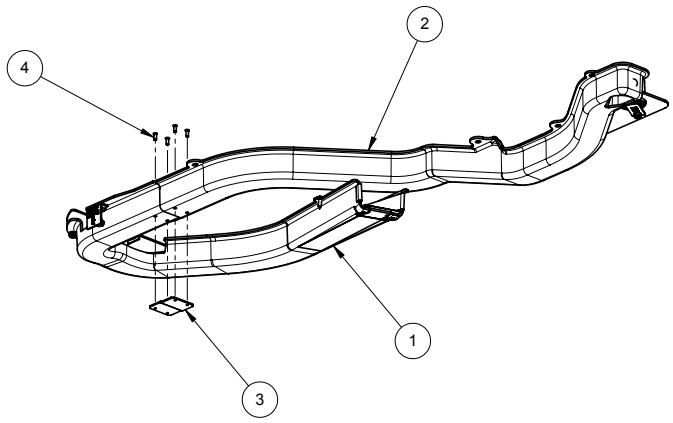
511-7907-00



ID	Part Number	Description	Qty
1	545-9965-00	LEFT PLASTIC RAMP EXIT, GOTG	1
2	550-5031-02	MINI MARS W/ EARS - RED SB	2
3	520-7000-00	SINGLE FLASH LED BOARD	2
4	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	4
5	240-5005-00	6-32 NYLON STOP NUT	4
6	545-5105-00	RUBBER BUMPER	1
7	242-5001-00	#6 WASHER	4
8	820-1016-25	DECAL #25, GOTG	1
9	820-1016-26	DECAL #26, GOTG	1
99*	036-6243-10	CABLE, 10" GENERIC LAMP 2-PIN	2

5.26 RIGHT RAMP ASSEMBLY

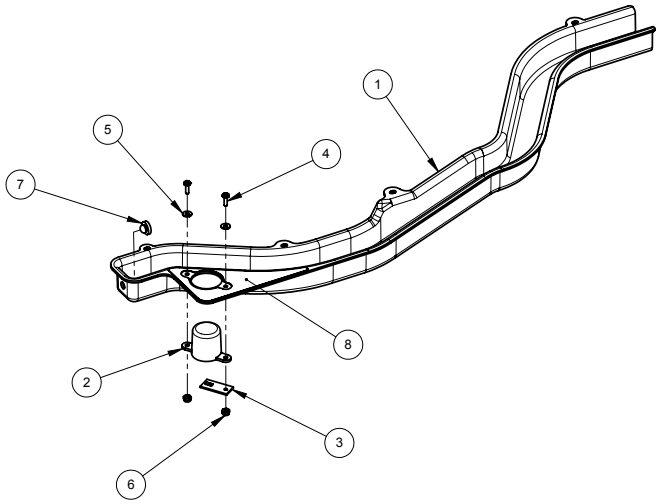
500-1070-00



ID	Part Number	Description	Qty
1	511-7908-00	ASSEMBLY, RIGHT RAMP ENTRANCE, GOTG LE	1
2	511-7909-00	ASSEMBLY, RIGHT RAMP EXIT, GOTG	1
3	535-0546-00	RAMP BRIDGE PLATE	1
4	237-6151-00	SCREW, 4-40 X 5/16" PFH U/C MS	4

5.27 RIGHT RAMP EXIT ASSEMBLY

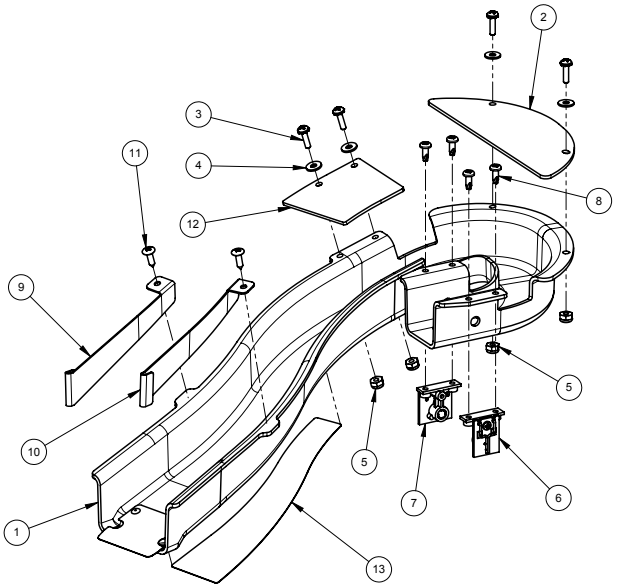
511-7909-00



ID	Part Number	Description	Qty
1	545-9967-00	RIGHT PLASTIC RAMP EXIT, GOTG	1
2	550-5031-02	MINI MARS W/ EARS - RED SB	1
3	520-7000-00	SINGLE FLASH LED BOARD	1
4	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	2
5	242-5001-00	#6 WASHER	2
6	240-5005-00	6-32 NYLON STOP NUT	2
7	545-5105-00	RUBBER BUMPER	1
8	820-1016-27	DECAL #27, GOTG	1
99*	036-6243-10	CABLE, 10" GENERIC LAMP 2-PIN	1

5.28 LEFT RAMP ENTRANCE ASSEMBLY

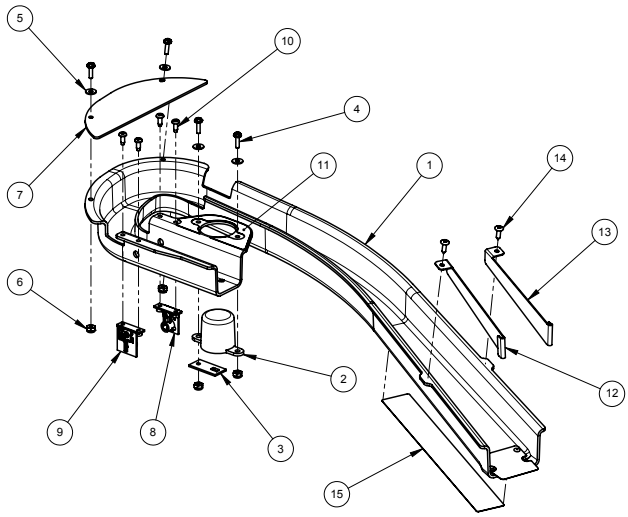
511-7906-00



ID	Part Number	Description	Qty
1	510-7715-00	RIVETED ASSY, LEFT RAMP ENTRANCE, GOTG	1
2	830-8401-22	PLASTIC #22, GOTG	1
3	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	4
4	242-5001-00	#6 WASHER	4
5	240-5005-00	6-32 NYLON STOP NUT	4
6	515-0215-00	LONG RANGE OPTO EMITTER ASSEMBLY	1
7	515-0215-01	LONG RANGE OPTO RECEIVER ASSEMBLY	1
8	237-5880-00	SCREW, #6 X 3/8 PPH T-25	4
9	535-1768-00	LEFT RAMP PROTECTOR, LEFT WALL, GOTG	1
10	535-1768-01	LEFT RAMP PROTECTOR, RIGHT WALL, GOTG	1
11	237-5809-00	SCREW, #6 X 1/2" PTH A	2
12	830-8401-29	PLASTIC #29, GOTG LE	1
13	820-1035-70	DECAL #70, GOTG LE	1
99*	605-5002-00	SHRINK TUBING 1/8 ID BLACK	.06 FT.

5.29 RIGHT RAMP ENTRANCE ASSEMBLY

511-7908-00



ID	Part Number	Description	Qty
1	510-7716-00	RIVETED ASSY, RIGHT RAMP ENTRANCE, GOTG	1
2	550-5031-02	MINI MARS W/ EARS - RED SB	1
3	520-7000-00	SINGLE FLASH LED BOARD	1
4	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	4
5	242-5001-00	#6 WASHER	4
6	240-5005-00	6-32 NYLON STOP NUT	4
7	830-8401-23	PLASTIC #23, GOTG	1
8	515-0215-00	LONG RANGE OPTO EMITTER ASSEMBLY	1
9	515-0215-01	LONG RANGE OPTO RECEIVER ASSEMBLY	1
10	237-5880-00	SCREW, #6 X 3/8 PPH T-25	4
11	820-1016-28	DECAL #28, GOTG	1
12	535-1769-00	RIGHT RAMP PROTECTOR, LEFT WALL, GOTG	1
13	535-1769-01	RIGHT RAMP PROTECTOR, RIGHT WALL, GOTG	1
98*	605-5002-00	SHRINK TUBING 1/8 ID BLACK	.06 FT.
99*	036-6243-10	CABLE, 10" GENERIC LAMP 2-PIN	1
14	237-5809-00	SCREW, #6 X 1/2" PTH A	2
15	820-1035-71	DECAL #71, GOTG LE	1

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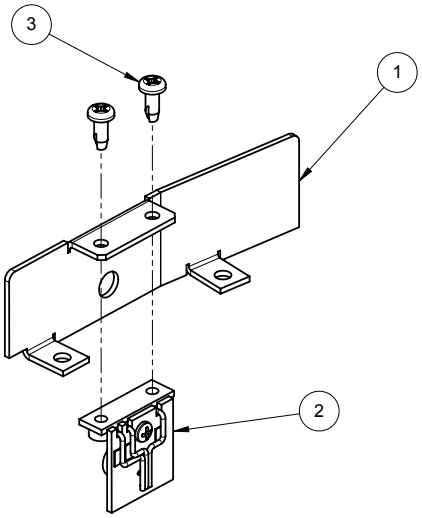
5.30 BALL GUIDE #2 & OPTO

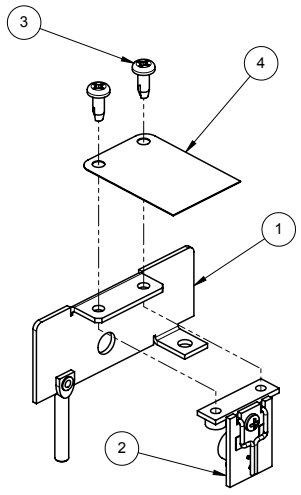
511-7900-02



ID	Part Number	Description	Qty
1	535-1627-02	BALL GUIDE #2, GOTG	1
2	515-0215-01	LONG RANGE OPTO RECEIVER ASSEMBLY	1
3	237-5880-00	SCREW, #6 X 3/8 PPH T-25	2

5.31 BALL GUIDE #3 & OPTO

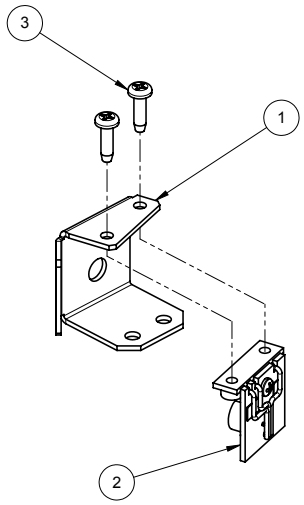
511-7900-03



ID	Part Number	Description	Qty
1	535-1627-03	BALL GUIDE #3, GOTG	1
2	515-0215-00	LONG RANGE OPTO EMITTER ASSEMBLY	1
3	237-5880-00	SCREW, #6 X 3/8 PPH T-25	2
4	545-6295-00	OPTO INSULATOR PAPER	1

5.32 BALL GUIDE #7 & OPTO

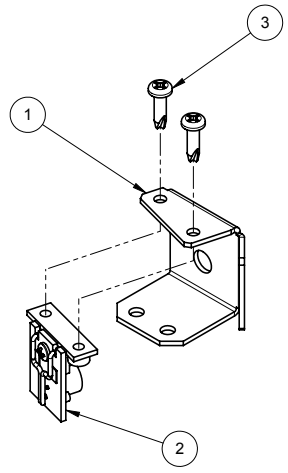
511-7900-07



ID	Part Number	Description	Qty
1	535-1627-07	BALL GUIDE #7, GOTG	1
2	515-0215-01	LONG RANGE OPTO RECEIVER ASSEMBLY	1
3	237-5880-02	SCREW, #6 X 1/2 PPH T-25	2

5.33 BALL GUIDE #8 & OPTO

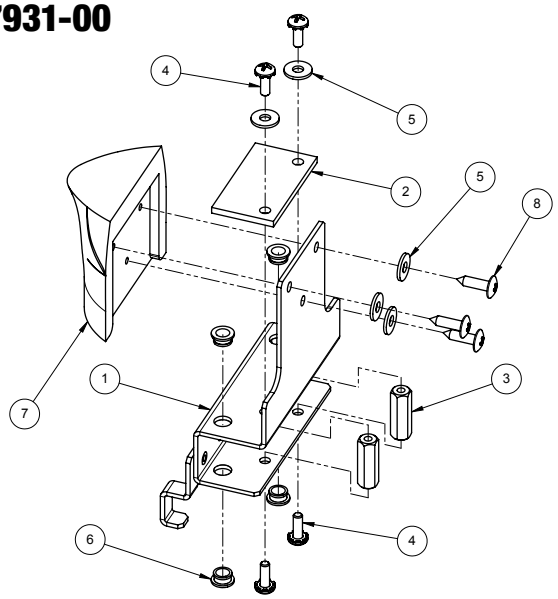
511-7900-08



ID	Part Number	Description	Qty
1	535-1627-08	BALL GUIDE #8, GOTG	1
2	515-0215-00	LONG RANGE OPTO EMITTER ASSEMBLY	1
3	237-5880-02	SCREW, #6 X 1/2 PPH T-25	2

5.34 GROOT JAW & BRACKET

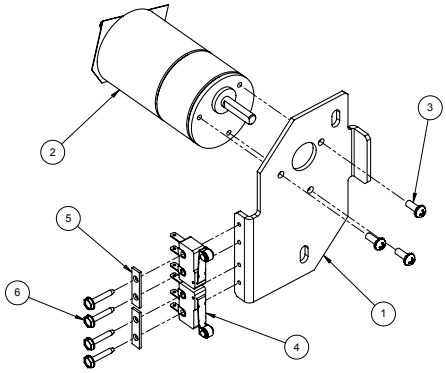
511-7931-00



ID	Part Number	Description	Qty
1	510-7727-00	RIVETED ASSY, JAW MOUNT BRKT, GOTG	1
2	545-9993-00	GLIDE STRIP, JAW LIFT, GOTG	1
3	254-5008-04	HEX SPACER - 3/4 "	2
4	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	4
5	242-5001-00	#6 WASHER	5
6	545-5352-00	NYLINER, 3/16" SHAFT	4
7	545-9982-01	MODIFIED TOY, GROOT JAW	1
8	237-5809-00	SCREW, #6 X 1/2" PTH A	3

5.35 GROOT JAW MOTOR & SWITCHES

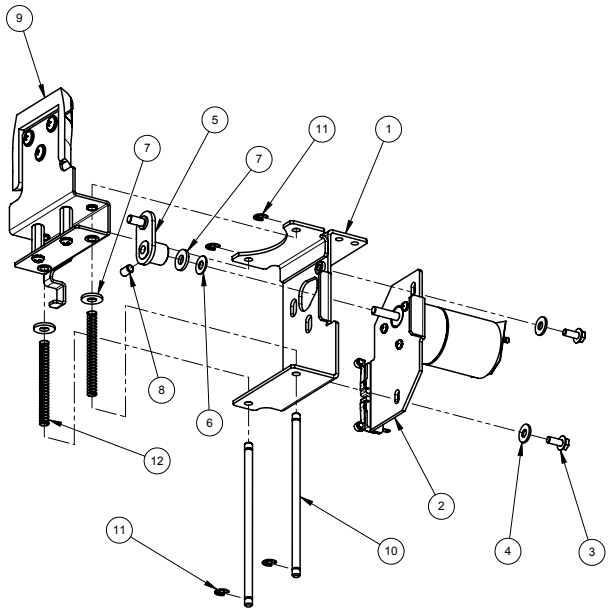
511-7932-00



ID	Part Number	Description	Qty
1	535-1791-00	BRACKET, JAW MOTOR ADJUST, GOTG	1
2	511-7926-00	MOTOR ASSEMBLY	1
3	237-5882-00	SCREW, #4-40 X 5/16 PRH SEMS	3
4	180-5119-02	MICRO-SWITCH - LIGHT ACTUATION	2
5	535-6539-00	SWITCH BODY PROTECT PLATE	2
6	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	4

5.36 GROOT JAW LIFT

500-1090-00



ID	Part Number	Description	Qty
1	515-1883-00	WELDMENT, JAW MOTOR BRACKET, GOTG	1
2	511-7932-00	ASSEMBLY, JAW MOTOR & SWITCHES, GOTG	1
3	237-5903-00	SCREW, 8-32 X 3/8" HWH	2
4	242-5005-00	#8 WASHER	2
5	515-1843-00	ASSEMBLY, JAW CRANK ARM, GOTG	1
6	242-5088-00	NYLON WASHER .195" X .437" X .031"	1
7	242-5003-00	#10 FLAT WASHER - 1/2" O.D. X .062 THICK	3
8	237-6092-00	SET SCREW, 10-32 X 5/16, SOCKET CUP PT	1
9	511-7931-00	ASSEMBLY, JAW & BRACKET, GOTG	1
10	530-7974-00	GUIDE ROD, JAW LIFT, GOTG	2
11	270-5001-00	RETAINING E-RING, 3/16" SHAFT OD	4
12	266-5109-00	COMPRESSION SPRING	2

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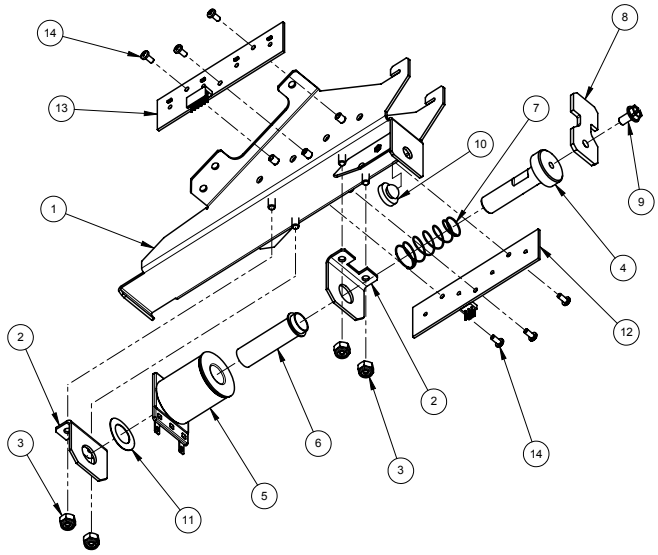
5.37 4-BALL TROUGH

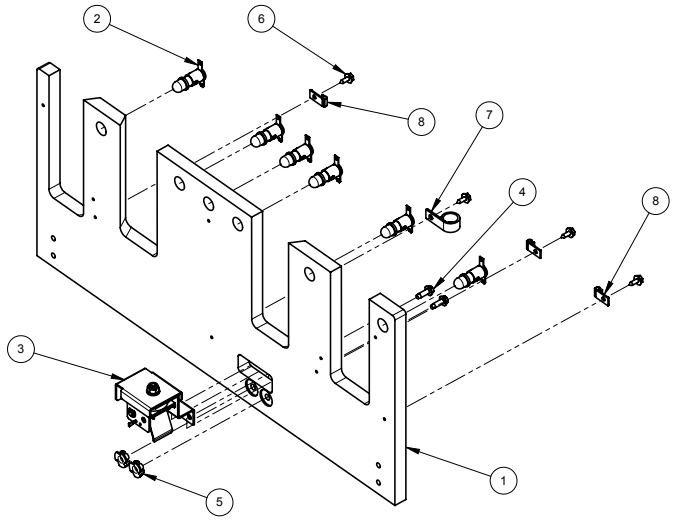
511-9975-00



ID	Part Number	Description	Qty
1	515-1845-00	TROUGH, 4-BALL LOCK, GOTG	1
2	535-1658-00	SLOTTED BRACKET, COIL MOUNT, GOTG	2
3	240-5102-00	8-32 NYLON LOCK NUT	4
4	530-5757-00	PLUNGER - D.T. ASSY.	1
5	090-5001-ND	COIL - 23-800, NO DIODE	1
6	545-5076-01	COIL SLEEVE	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	535-1662-00	PLATE, BALL PUSHER, GOTG	1
9	237-5985-00	SCREW, 10-32 X 3/8" HWH SWAGE	1
10	545-5105-00	RUBBER BUMPER	1
11	269-5002-00	SPRING WASHER	1
12	520-7065-00	PCB, 4-OPTO TRANSMITTER	1
13	520-7064-00	PCB, 4-OPTO RECEIVER	1
14	237-6169-00	SCREW, 4-40 X 1/4 PPH MS	6

5.38 BACK PANEL ASSEMBLY

500-1068-00



ID	Part Number	Description	Qty
1	525-9720-00	BACK PANEL, GOTG	1
2	519-5000-08-LED	SOCKET & LED ASSY, WHITE	6
3	511-5096-00	ASSY, ELEC GATE LEFT, BP MT	1
4	237-5975-01	SCREW, 8-32 x 1/2 HWH SLOT SERR SW ZINC	2
5	240-5101-00	8-32 T-NUT	2
6	234-5000-00	SCREW, #6 X 3/8" HWH	4
7	040-5000-06	1/2" CABLE CLAMP	1
8	040-5000-01	1/8" CABLE CLAMP	3
97*	600-5003-00	BRAIDED WIRE - 20 GAUGE	0.54 FT.
98*	631-5000-00	STAPLE - 5/16	12
99*	036-6267-14-L6	BACK PANEL CABLE	1

6. SPECIFICATIONS

500-55L7-01

SPECIFICATIONS, MECHANICAL, GAME SETUP

Specification	Imperial	Metric
Weight	210 lbs	96 kg
Max dimensions, leg levelers extended (h, w, d)	78 x 27.75 x 57 in	198 x 70.5 x 145 cm
Minimum game dimensions (h, w, d)	76 x 27.75 x 57 in	193 x 70.5 x 145 cm
Minimum room dimensions per game (h, w, d)	80 x 36 x 84 in	203 x 91 cm x 214 cm

- (h, w, d) = height, width, depth.

SPECIFICATIONS, MECHANICAL, BOXED

Specification	Imperial	Metric
Weight, boxed (without pallet)	230 lbs	105 kg
Box dimensions (h, w, d)	56.5 x 31 x 31 in	144 x 79 x 79 cm
Minimum dimensions (h, w, d)	76 x 26 x 57 in	193 x 66 x 145 cm

- (h, w, d) = height, width, depth.

SPECIFICATIONS, ELECTRICAL

Specification	North America - 120VAC	International - 240VAC
Line Voltage, Nominal	120 VAC	240 VAC
Line Voltage Range	90 VAC - 250 VAC	90 VAC - 250 VAC
Line Frequency *	60 Hz	50 Hz, 60 Hz
Line Power, Current - attract mode	70 W, 0.6 A @ 120 VAC	70 W, 0.3 A @ 240 VAC
Line Power, Current - nominal	360 W, 3 A @ 120 VAC	360 W, 1.5 A @ 240 VAC
Line Power, Current - peak, <100 ms	540 W, 4.5 A @ 120 VAC	540 W, 2.25 A @ 240 VAC

* NOTE: Games designed for 60hz operation (e.g. North America games) will not function correctly on 50hz power and vice versa.

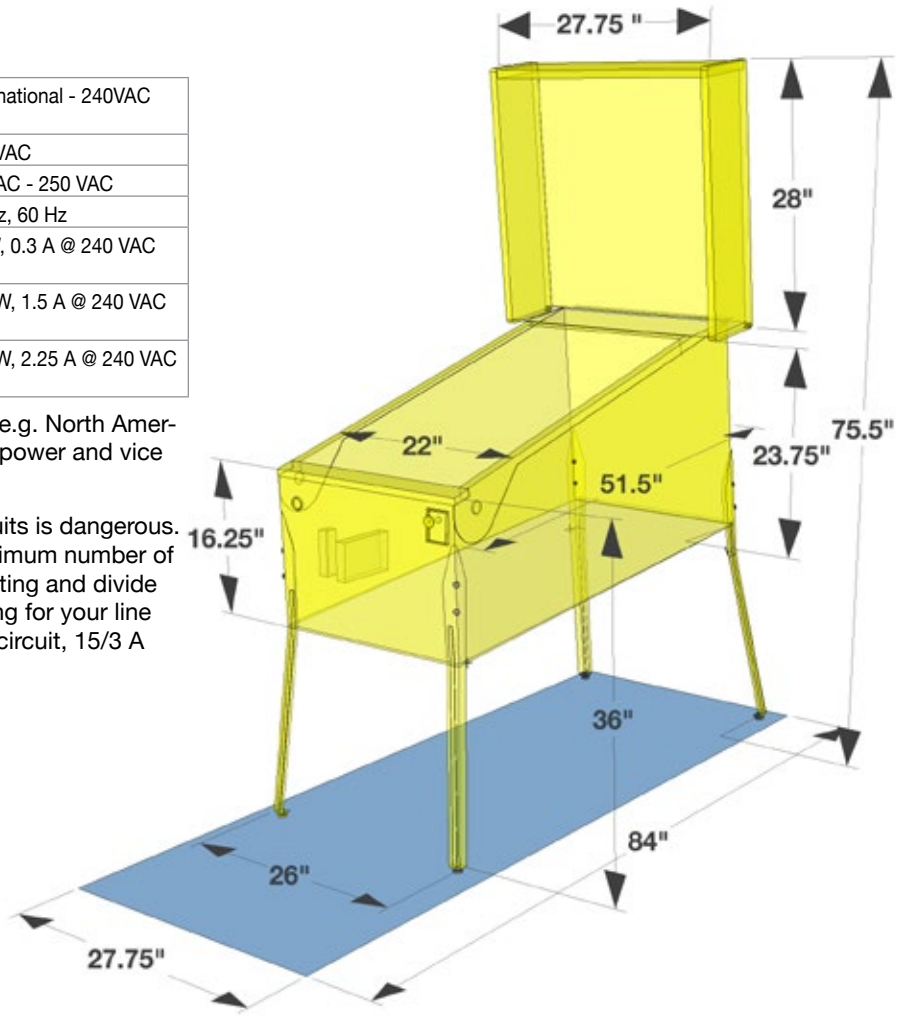
WARNING: Overloading electrical supply circuits is dangerous. Do not overload circuits. To calculate the maximum number of games for a circuit, check circuit amperage rating and divide by the game Nominal Line Power Current rating for your line voltage. For example, a 15A 120V household circuit, 15/3 A (nominal current) = 5 games maximum.

SPECIFICATIONS, ENVIRONMENT

	Minimum	Maximum
Temperature, Operating	32 °F / 0 °C	104°F / 40 °C
Temperature, Storage	32 °F / 0 °C	104°F / 40 °C
Relative Humidity, Operating	5%	95% non-condensing
Relative Humidity, Storage	5%	95% non-condensing

- (a) "The appliance has to be placed in a horizontal position."
- (b) "This appliance is not to be cleaned by a Water Jet."
- (i) "Do not locate this appliance in an area where a Water Jet is used."
- (ii) "Do not clean this appliance with a Water Jet."
- (b) If the supply cord is damaged, it must be replaced in order to avoid a hazard.

6.1 GAME DIMENSIONS



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6.2 WARRANTY

500-55L7-01

Stern Pinball machines are assembled in Elk Grove Village, Illinois, USA; each pinball machine has unique characteristics that make it a one-of-a-kind American-made product. Each machine will have variations in appearance resulting from differences in the machine's particular wood parts, individual silk screened art and mechanical assemblies. Stern Pinball has inspected each game element to insure it meets stringent quality and playability standards.

STERN PINBALL INC LIMITED WARRANTY

Stern Pinball Inc ('SELLER') warrants only to the initial purchaser of its products that the items listed below are free from defects in material and workmanship under normal use and service for the warranty period specified:

- Printed circuit boards (game logic): 2 months
- Dot Matrix / LCD Display: 9 months

No other parts of seller's product are warranted.

Warranty periods are effective from the initial date of shipment from seller to its authorized distributors.

Seller's sole liability shall be, at its option, to repair or replace products which are returned to seller during the warranty periods specified, provided:

1. Seller is notified promptly upon discovery by purchaser that stated products are defective.
2. Such products are properly packaged and then returned freight prepaid, to seller's plant.

This warranty does not apply to any parts damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall the seller be liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages, or any other losses incurred by the customer in connection with the purchase of a Stern Pinball Inc Product.

WARRANTY DISCLAIMER

Except as specifically provided in a written contract between seller and purchaser, there are no other warranties, express or implied, including any implied warranties of merchantability or fitness for a particular purpose.

This Game Service Manual and all other documents relating to this product, playfield components, features, rules, programming, and operation are subject to change without notice (Service Bulletins, if applicable, available through official Stern Pinball website).

ATTENTION!
IMPORTANT WARRANTY INFORMATION

The electronics system, node network architecture, mechanical devices and associated software control systems in this pinball machine are designed to work with genuine Stern Pinball accessories and devices.

Installation of non-authorized accessories, lamps, LED's, motors or other devices or modification of electro-mechanical devices may damage the system and will void your warranty.

6.3 WARNINGS, COMPLIANCE, AND LEGAL NOTICES

PHOTOSENSITIVE SEIZURES HEALTH WARNING

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns. Even people with no history of seizures of epilepsy may have an undiagnosed condition that can cause "photosensitive epileptic seizures" due to certain visual images, flashing lights or patterns. Symptoms can include lightheadedness, altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, momentary loss of awareness, and loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

IMMEDIATELY STOP PLAYING AND CONSULT A DOCTOR IF YOU EXPERIENCE ANY OF THESE SYMPTOMS.

PARTS SUBSTITUTIONS

For safety and reliability, substitute parts and equipment modifications are not recommended and may void any and all warranties. Use of Non-Stern Pinball Inc Parts or Modifications of game circuitry may adversely affect game play or game safety. Transport pinball machines with hinged backbox in the down position only! Always take great care when servicing any game. Always ready the service manual before replacing or servicing components. Substitutions of parts or equipment modifications may void FCC type acceptance.

Always disconnect the line voltage before servicing. Some parts may remain energized when unplugged. Take great caution when servicing any electrical components.

FCC CLASS A SUBPART J COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF INTERFERENCE NOTICE

The cable harness placements, ground strap routing, and other shielding have been designed to keep RF radiation and conduction within levels accepted by FCC rules. To maintain these levels, factory harness position, shielding, and ground straps must be installed in their factory locations should they become disconnected during maintenance.

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GUARDIANS OF THE GALAXY LE #500-55L6-01
GUARDIANS OF THE GALAXY PREMIUM #500-55L7-01
MANUAL #780-50L6-00